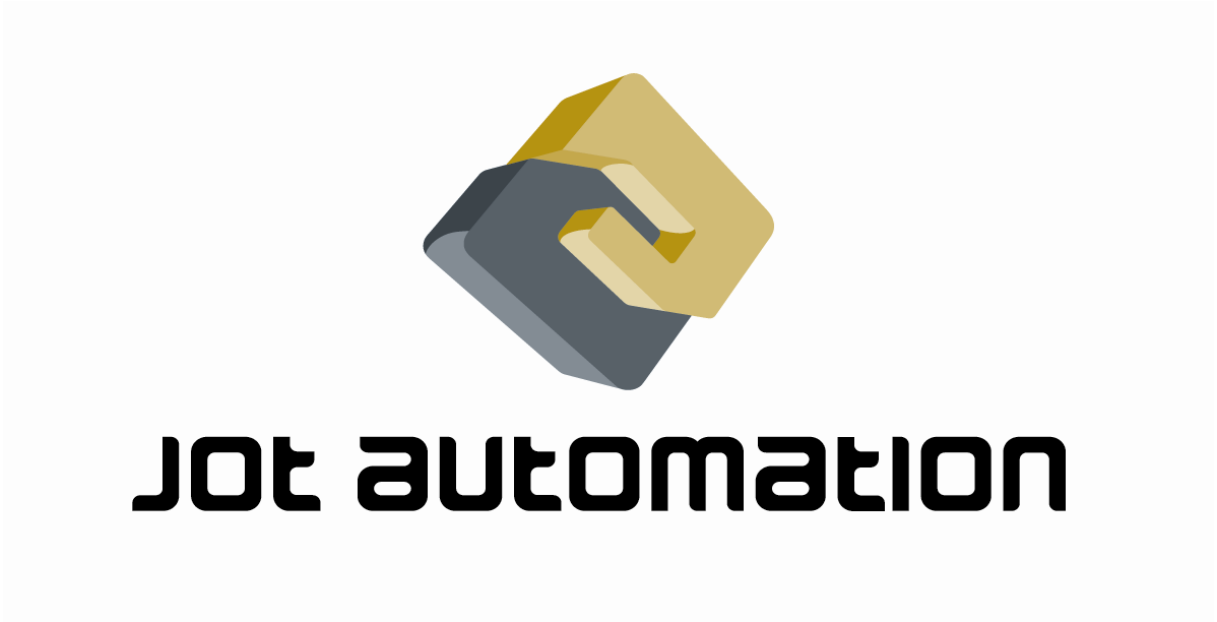

J002-872.1
Scanning Unit
OD000422.0.0

PRODUCT MANUAL

1 ABOUT THE MANUAL

2 SAFETY

3 TECHNICAL SPECIFICATION

4 IMPLEMENTATION

5 OPERATION

6 MAINTENANCE

7 TROUBLESHOOTING

8 APPENDICES

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1 ABOUT THE MANUAL

1.1 TYPOGRAPHIC CONVENTIONS 2
1.2 ABBREVIATIONS 2
1.3 CONTACT INFORMATION 2

1 ABOUT THE MANUAL

This document is principally intended for guidance to ordinary users of the machine. The purpose of this document is to give a general description of the machines operation and instructions on how to use it correctly and safely; it does not contain any detailed information about the operation or electrical connections. Further information is available in the machines technical documentation and from the manufacturer.

The information described herein is subject to change without notice. The manual has been checked for both reliability and accuracy. However, if you have any questions, or notice any errors or omissions in this manual, please contact the Field Service of JOT Automation.

1.1 TYPOGRAPHIC CONVENTIONS

The following typographical conventions are used to point out potential hazards and other important issues:

Warning

Text notifies the reader of circumstances, which may cause personal injury.

Caution

Text notifies the reader of circumstances, which may cause serious damage on the device.

Note

Text is used to stress issues of special importance.

1.2 ABBREVIATIONS

DUT	Device Under Test
PWB	Printed Wire Board (same as PCB)
PCB	Printed Circuit Board (same as PWB)
RoHS	Restriction of Hazardous Substances
UDP	User Datagram Protocol

1.3 CONTACT INFORMATION

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2 SAFETY

2.1 GENERAL SAFETY INSTRUCTIONS 2
2.2 DANGEROUS ELEMENTS AND ISSUES 4
2.3 SAFETY DEVICES 4
2.4 SYMBOLS AND LABELS 5

2 SAFETY

This product consists of several modules and components. The manufacturing process includes functions that may induce mechanical hazards, electrical hazards, and other hazards that may form as a combination of the mentioned hazards. These hazards may result in death, severe injury or product damage.

However, the hazards mentioned in the list above are located behind the protective doors. Opening the doors will immediately stop operations and cut power from hazardous objects and mechanisms. Therefore it is utterly important to keep the machinery in its original condition and functionality.

Warning

Any modifications to the machine or software are forbidden without permission from the manufacturer.

Unauthorized modifications or even temporary alterations to the machine or its functioning may affect the user safety and will cancel manufacturer's liability for the product.

Safety of machinery is in conformity with the regulations of the European Directives as indicated on the Declaration of Conformity signed for the machinery in question. Safety standards, which have been applied to the safety functions, are also stated on the Declaration of Conformity.

Note

Use of any controls, adjustments or performance of procedures other than those specified herein may result in hazardous situations with the machinery.

2.1 GENERAL SAFETY INSTRUCTIONS

This chapter includes general safety instructions for personnel operating the Scanning Unit. Read these instructions before performing any operations on the machine.

Note

The machine may only be used by a person who is qualified to operate it and knows the safety issues involved in operating it.

- Do not wear loose or hanging clothes, tie or jewellery. Keep long hair bound.
- Perform operations according to instructions of this manual and all the manuals enclosed for the components included in the machine.
- When personnel, material or machine is in danger, stop the unit immediately by pressing the Emergency stop button.
- Do not place containers holding fluids such as coffee or soft drinks on the machine.

- Do not direct a strong spray of fluid at the machine. If a spray of fluid is directed at the machine, turn the mains off immediately and unplug the power cord. Do not touch the machine due to a risk of electric shock.

- Do not place heavy objects against or on top of the machine as they may distort the operation. In case of a visible change in the machines shape, turn the mains off immediately and unplug the power cord. Do not touch the machine due to a risk of electric shock.

- If the machine is displaced, e.g. due to an external force, check the condition of the power cord. A damaged cord may cause an electric shock.

- When the machine is in operation, do not penetrate the manipulator's workspace.

- Do not stare into laser beam.

- Perform teaching operations when operators are outside the manipulator's workspace. If it is impossible to perform teaching operation without penetrating the manipulator's workspace, be prepared to press the Emergency stop button in case of unpredictable erroneous motion or operation.

Note

Only personnel with special training may perform operations, such as teaching points for robots.

- Carry out inspections when the machine is out of operation. If it is impossible to carry out inspection when the machine is out of operation, keep outside the manipulator’s workspace.

- Do not use the machine if it develops a fault or its safety devices are damaged.

- Do not make any modifications for electrics or mechanics of the machine.

- Do not make any modifications for the safety equipment.

2.2 DANGEROUS ELEMENTS AND ISSUES

During operation and maintenance procedures pay special attention to the following issues which may cause danger despite the safety equipment:

- Robot; movements, impact energy
- Conveyors; grabbing
- Electric devices in general; risk of electrical shock
- Laser devices and sensors; laser radiation, risk of eye injury
- Vacuum system; mechanical risk
- Pneumatic system; movements, impact energy

The machine includes a class 2 laser device which is classified as safe. However, staring intensively into laser beam may lead into eye injury.

Study carefully safety instructions for concerning issues mentioned above.

2.3 SAFETY DEVICES

The machine is equipped with:

- An emergency stop button, located on the membrane terminal. The button is red and it is mounted on a yellow base.
- Safety limit switches in all the hatches.

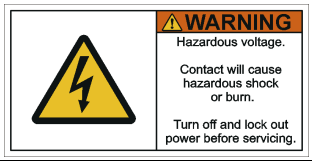
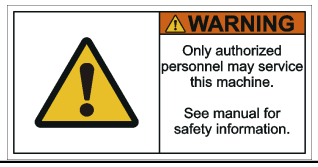
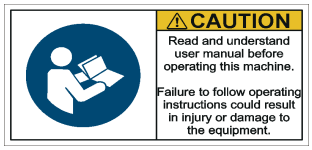
Pressing the emergency stop button stops the operation of all the machines in Tiny line. Opening a hatch stops the operation of the machine and adjacent machines in Tiny line. Press the emergency stop button if personnel or machine is in danger.

Warning

Never bypass the safety devices or use the machine if the safety devices are damaged.

2.4 SYMBOLS AND LABELS

The following symbols and labels indicate potential hazards when operating the machine.

Label	Description
	Hazardous voltage. Contact will cause hazardous shock or burn Turn off and lock out power before servicing.
	Only authorized personnel may service this machine. See manual for safety information.
	Read out and understand user manual before operating this machine. Failure to follow operating instructions could result in injury or damage to the equipment.

3 TECHICAL SPECIFICATION

3.1 GENERIC TECHNICAL DATA 2
3.1.1 Mechanics 3
3.2 TECHNICAL SPECIFICATION TABLE 4
3.3 PRODUCTS TO BE HANDLED 4
3.4 RATING PLATE 5
3.5 FUNCTIONAL DESCRIPTION 6
3.5.1 Operation 6
3.5.2 Axes 6

3 TECHNICAL SPECIFICATION

This chapter provides technical information about the machine.

3.1 GENERIC TECHNICAL DATA

The JOT Automation Scanning Unit reads 2D-codes from PWBs and forwards the PWBs to the master Tiny. It is intended for use in conditions prevalent only in production lines of the electronics industry.

The machine is controlled by a programmable logic. The logic interface with upstream and downstream devices is implemented via UDP and SMEMA handshaking. The control equipment is located on the panel in the upper part of the frame.

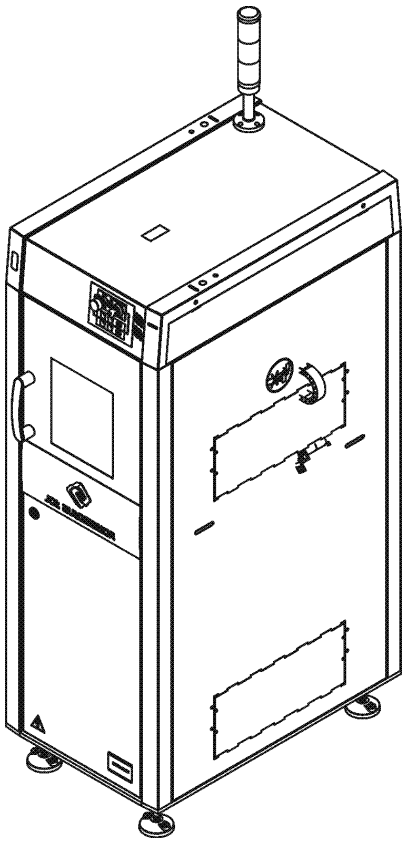


Figure 3.1-1 Main view

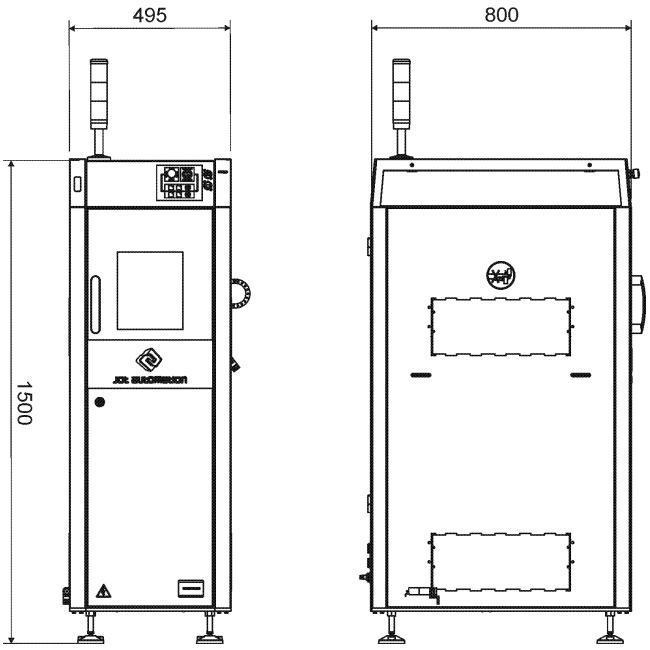


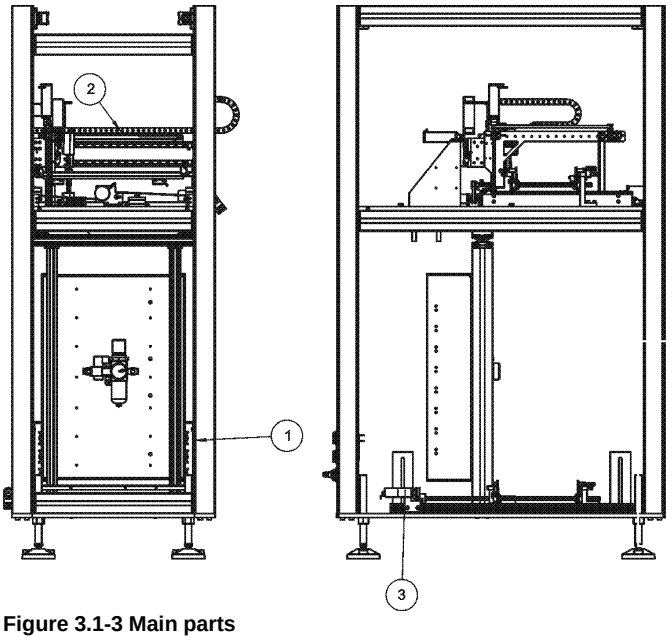
Figure 3.1-2 Dimensions

3.1.1 MECHANICS

The device consists of

- Steel and aluminum profile construction
- Linear motor robot axes (X-Y)
- Conveyor
- Return conveyor
- Industrial PC
- Graphical user interface

The whole system is CE and cUL approved.



① Frame
② XY-axes and conveyor
③ Return conveyor

Figure 3.1-3 Main parts

3.2 TECHNICAL SPECIFICATION TABLE

	Scanning Unit J002-872.1
Dimensions	
Width	498 mm
Depth	800 mm
Height	1500 mm
Weight	**118 kg**
Handshaking	**According SMEMA standard**
Electrics	
Supply Voltage	110/230 VAC (60/50 Hz)
Power consumption	160 W
Pneumatics	
Supply Pressure	0.6 MPa
Other requirements	Clean, filtered air
Air consumption	1 l/min
Noise level at the workstation	
Sound pressure level (LAeq, 15 min)	Lower than 70 dB(A)
Surroundings	
Ambient Temperature	<+30 ºC

***Noise level is measured at the working place when the machine is in operation according standard EN ISO 11201**

3.3 PRODUCTS TO BE HANDLED

The machine is capable of handling PWBs as described below.

Length up to, mm (")	300 (11.8)
Width up to, mm (")	150 (5.9)
Thickness, mm ("), flat belt	1.0-3.0 (0.04-0.12)
Thickness, mm ("), round belt	0.5-3.0 (0.02-0.12)
Carrying edge, mm (")	3.0 (0.12)
Weight, kg (lb)	max. 2.0 (4.4)
Component height	
Lower max. mm (")	15 (0.6)
Upper max. mm (")	15 (0.6)

3.4 RATING PLATE

Rating plate is situated either on the backside of the machine, near the lower right corner.

The rating plate contains following information:

- Manufacturer and contact information
- Date (Date)
- Project number (No)
- Product code and name (Product)
- Serial number (S.No)
- CE logo
- RoHS logo
- Date of production (yyyy/mm/dd)
- Supply pressure (bar)
- Air consumption (l/min)
- Operating voltage (V)
- Operating frequency (Hz)
- Current consumption (A)
- Power consumption (kVA)
- Weight (kg)
- CE logo
- RoHS 15 logo
- WEEE logo

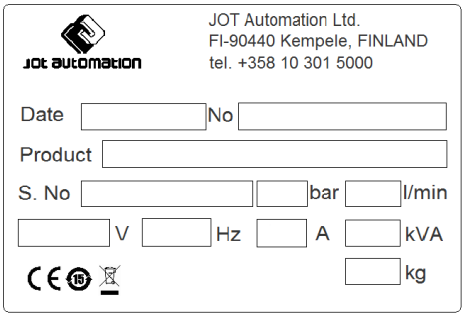


Figure 3.4-1 Rating plate

3.5 FUNCTIONAL DESCRIPTION

Operation of the machine is engaged by UDP and SMEMA handshakings with adjoining machines.

3.5.1 OPERATION

An idle scanning unit requests for a PWB. A sensor at the infeed edge detects arriving PWB and it is conveyed to the predefined location. The machine checks position and orientation of each PWB by laser measurement sensor. First it scans the control points; height of a component in predefined point and a hole in the PWB in predefined point.

If the PWB is incorrect or incorrectly placed, the control points cannot be found and the operation of the machine stops with an alarm. The PWB can be removed when the machine is in service mode. Before feeding in a new PWB, the incorrectly placed / incorrect PWB has to be removed, service mode switched off, and error checked on touch screen.

After the control points are successfully found, the scanning unit reads PWBs 2D-code with a camera. After the code reading is carried out, the unit signals that the PWB can be forwarded and a new PWB can be received.

Finally the PWB is forwarded to the master Tiny Unit, which forwards PWBs to next available Tiny or directly to Fail Marker Unit.

An error or a malfunction is indicated by the beacon and the buzzer. Cause of the error is shown on the touch screen. Refer to chapter 7 Troubleshooting.

3.5.2 AXES

The conveyor conveys PWBs in X-axis direction. The camera and the laser sensor move along XY-axes. XY-location is programmed in the GUI.

4 IMPLEMENTATION

4.1 ACCEPTING DELIVERY 2
4.2 UNPACKING 2
4.3 REQUIRED FLOOR SPACE 2
4.4 INSTALLING MECHANICS 2
4.5 ELECTRIFICATION 3
4.6 CONNECTING PNEUMATICS 4
4.7 CONNECTING CONTROL SYSTEM 4
4.8 ADJUSTMENTS AND CALIBRATION 4
4.9 THE FIRST START-UP 4
4.10 WITHDRAWAL FROM USE AND STORAGE 5
4.10.1 Temporary storage 5
4.10.2 Long-term storage and transportation 5
4.10.3 Permanent withdrawal from use 5

4 IMPLEMENTATION

This chapter includes instructions for installation and mechanical adjustment.

4.1 ACCEPTING DELIVERY

Before signing the bill of freight, inspect

- The packages for visual defects.
- All shock- and tilt watches and make sure they are not reacted.

Write down all defects to the bill of freight and take descriptive pictures.
Inform the defects to JOT Automation.

4.2 UNPACKING

Move the package carefully and lift it only from the indicated places. Pay attention to transportation and handling instructions marked on the package.

Unpack the machine very carefully. Pay attention not to accidentally damage any sensitive components, change factory settings or damage the surface finishing.

Use extreme care when lifting the machine from the shipping platform. The machines center of gravity may not be at the expected location. Make sure no cables, etc. are pinched between the machine and the forks of the forklift.

If the machine has been brought in from cold surroundings, allow the temperature of the machine to stabilize for hours before unpacking the machine.

Note

The machines center of gravity may not be at the expected location. Use extreme care when lifting the machine.

Caution

If the machine has been damaged during shipment, it is forbidden to use it prior to checking the faults.

4.3 REQUIRED FLOOR SPACE

When installing the machine, leave enough free space for maintenance, operating and moving around.

4.4 INSTALLING MECHANICS

This phase of the installation must be done extremely carefully because it has a major effect on the machines operational reliability.

The machine must be installed at the factory according to the instructions given by the person responsible for installation.

Installation instructions:

- Reinstall the auxiliary equipments, which were removed for shipping.
- Level the machine in both directions and adjust the height indicated in the layout drawings by means of the adjustable legs and a bubble tube.
- Fasten the machine mechanically to the surrounding units. Make sure to fasten the machine so that it will not move even if it is pushed lightly.
- Install the safety devices.
- Check the functioning of the safety devices with the person responsible for safety at work.
- Ensure that there are no obstructions to product travel at the interface to adjoining machines.
- Check the installation by moving a product along the conveyor manually.

Note

The final check of the installation will take place during the test run / start-up.

If adjacent machine is not a JOT product, place a safety cover in front of the conveyor openings of the machine.

If a single JOT product has been ordered to the production line, JOT Automation is not responsible for the safety around the machine.

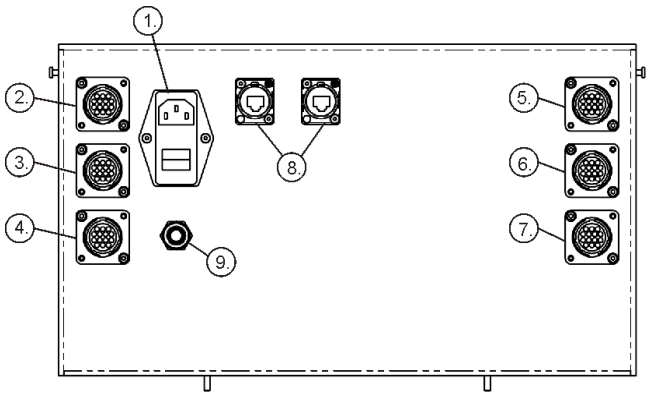
4.5 ELECTRIFICATION

Caution

If the machine is delivered the end of the power cable open (with no contact plug) or if the contact plug has to be changed into another plug that conforms to national standards, ensure that the plug or other similar connection is correctly connected and the voltage is correct.

Switch the mains off, in the 0 position, before plugging in the power cable.

Verify the accurate supply voltage from the rating plate.



① Power cord
② X32 Smema next 1
③ X34 Smema next 2
④ Line E-Stop next
⑤ X31 Smema previous 1
⑥ X33 Smema previous 2
⑦ Line E-Stop previous
⑧ Ethernet connections
⑨ Compressed air inlet

Figure 4.5-1 Connections

4.6 CONNECTING PNEUMATICS

Connect the machine to a pressurized air source. For pressurized air requirements see chapter 3.2 Technical Specification.

4.7 CONNECTING CONTROL SYSTEM

Connect the handshaking cables:

- connector X31 to previous machine
- connector X32 to following machine

Check the handshaking protocol of the adjoining devices. The machine requires a separate adapter to be able to function together with devices that do not conform to SMEMA handshaking.

4.8 ADJUSTMENTS AND CALIBRATION

The machine has been adjusted and calibrated at the factory. However, the adjustments and calibrations might have changed during shipment. Therefore, check the basic settings of the machine during installation together with the person responsible for operation of the machine. This will ensure the maximum degree of usage of the machine in production.

Set and test the conveyor width adjustment with an actual conveyed product.

4.9 THE FIRST START-UP

Before starting and using the machine, familiarize yourself with the operation and safety instructions and check that no adjustments have changed after the factory test run and no parts have loosened during shipment.

Use extreme care when starting the machine for the first time. The adjustments, calibrations, etc. might have changed during shipment making it possible to damage the machine or products during the first run.

To achieve the best possible results, perform the final test run in the production environment. This will indicate how well the machine functions together with adjacent machines, i.e. how well handshaking functions.

Make sure all the necessary warning signs, stickers and tapes are fastened to the machine before using it the first time.

4.10 WITHDRAWAL FROM USE AND STORAGE

4.10.1 TEMPORARY STORAGE

Store the machine in a warm and dry place.

4.10.2 LONG-TERM STORAGE AND TRANSPORTATION

Store the machine in a warm and dry place, preferable in the original delivery package. When transporting the machine use the original delivery package.

Before long-term storage:

- Save program settings and parameters as a backup copy.
- Carry out the nearest upcoming maintenance operation; update the maintenance log book. Refer to chapter 6 Maintenance.

4.10.3 PERMANENT WITHDRAWAL FROM USE

The wheelie bin symbol in the machines rating plate indicates that the machine must not be disposed of with common household waste. The product that has come into end of its lifecycle must be disposed of as defined in the WEEE Directive (The Waste Electrical and Electronic Equipment Directive).

When a JOT Product has come into its end of lifecycle, please contact the closest JOT office for information about the disposal of the product.

5 OPERATION

5.1 USER INTERFACE 2
5.1.1 Membrane terminal 2
5.1.2 Other control buttons 2
5.1.3 Graphical user interface 3
5.1.4 Light beacon and buzzer 4
5.1.5 Emergency stop 4
5.1.6 Service switch 4
5.2 OPERATION PROCEDURES 4
5.2.1 Control routines 4
5.2.2 Normal Start-up 5
5.2.3 Emergency stop 5
5.2.4 Starting after Emergency stop 5
5.2.5 Reset 5
5.2.6 Normal Shut-down 5
5.3 CONFIGURATION 6
5.3.1 How to select product 6
5.3.2 How to teach robot points to product 9
5.3.3 How to configure machine position in line (node and IP-address) 12
5.3.4 How to correct robot points 13
5.3.5 How to select data stored to log 15
5.3.6 Activate error on failed reading' 15
5.4 CALIBRATION 16
5.4.1 Conveyor calibration 16
5.5 CONTROL AND MONITORING 17
5.5.1 Monitoring DUT Status 17
5.5.2 Monitoring Cell information 18
5.5.3 Sequence monitoring 18
5.5.4 Manual control 18
5.5.5 I/O Control 20
5.5.6 Global variable control 20
5.5.7 Analog variable control 21

5 OPERATION

5.1 USER INTERFACE

This chapter includes a brief description about the use and purpose of the controlling equipment. The Scanning Unit is controlled via the first Tiny Unit in the Tiny line.

5.1.1 MEMBRANE TERMINAL

The main control buttons are on the membrane terminal.

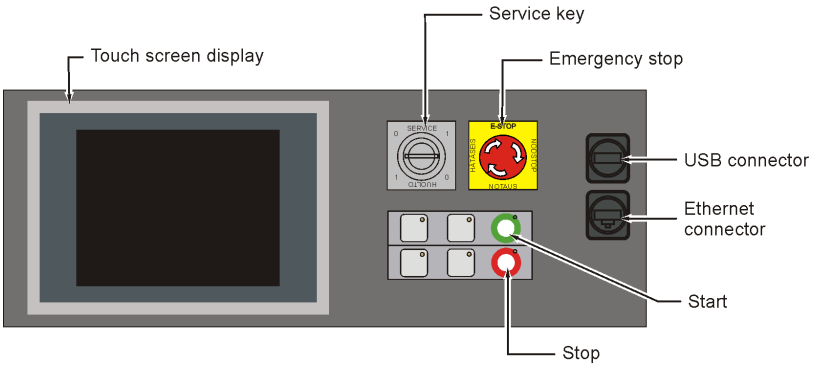


Figure 5.1-1 Control panel

Emergency Stop	Ceases all the functions immediately.
Power On	Turns the power on.
Power off	Turns the power off and stops the operation. The GUI remains open but products cannot be driven.
Start	In the GUI. Turns the operation mode on. The machine performs reference drive at start. Resets the machine when pressed continuously for three seconds.
Stop	In the GUI. Turns the operation mode off. The GUI remains open and products can be driven manually. Pressing 3 seconds resets the machine.
Buzzer off	In the GUI. Turns the buzzer off.
Service Key Switch	In service mode the door safety switches are overridden. The machine operates with limited speed when the covers are open.

Note

Only authorized service personnel are permitted to use the machine in service mode.

USB Connector	To connect an USB memory stick.
Ethernet Connector	For service purposes.

5.1.2 OTHER CONTROL BUTTONS

Main switch	On the back of the machine. Switches on/off the main power

5.1.3 GRAPHICAL USER INTERFACE

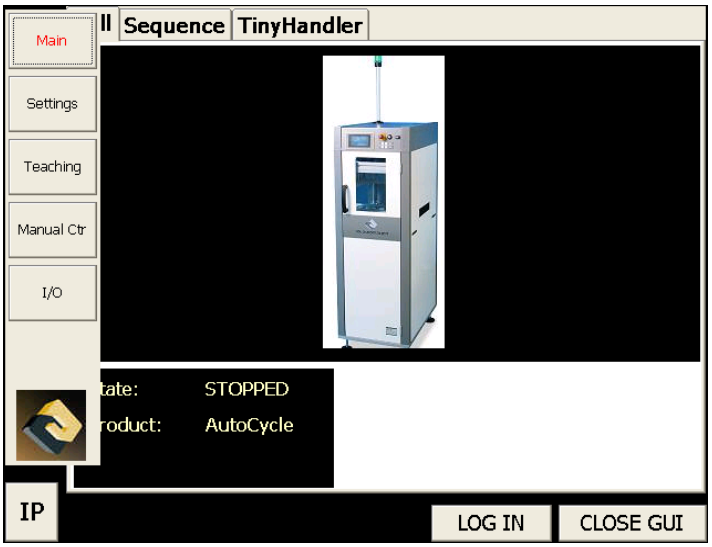
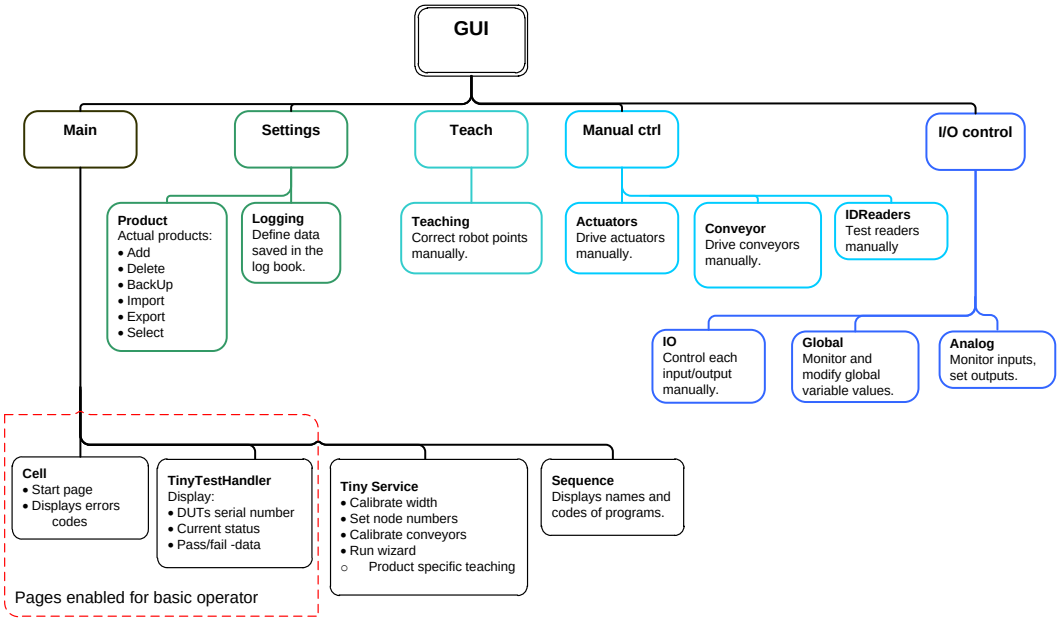


Figure 5.1-2 GUI

Buttons

MENU	Opens the menu list
START	Starts the operation
STOP	Stops the operation, Resets the unit
IP	Opens the keyboard window
LOG IN	Opens the login dialog box.
CLOSE	Closes the window
	Displays the version numbers of software components

GUI –sitemap



5.1.4 LIGHT BEACON AND BUZZER

Beacon lights signal the status of the machines:

Green light:	Automatic mode
Green light, flashing:	Reference drive
Yellow light:	Operating voltage is not on
	No air pressure
	No move permission
	Incoming pallet jammed
	Outgoing pallet jammed
	Remove pallet
Red light:	Alarm
	Door open
	Emergency Stop pressed
Buzzer:	During yellow light or alarm

5.1.5 EMERGENCY STOP

Pressing the emergency stop button will stop the unit immediately and cut the power off from relays and valves. The emergency stop is not a normal procedure for stopping the machine.

5.1.6 SERVICE SWITCH

Note

Only authorized service personnel is permitted to use the machine in service mode.

Turning the service switch key to position 1 activates service mode. In service mode the machine operates with limited speed, when the covers are opened.

5.2 OPERATION PROCEDURES

5.2.1 CONTROL ROUTINES

Before starting the machine

Inspect the machine carefully and make sure there is nothing on the machine which might prevent the use of the machine, damage it or cause injury to the operator.

During operation

Observe the operation of the machine and report any malfunctions to the maintenance personnel. When noticing a defect in the machine, immediately contact the service personnel.

Weekly servicing

Clean the surfaces of the machine with a general-purpose liquid detergent.

5.2.2 NORMAL START-UP

Before starting check that:

- There is nothing inside the machine; products inside the machine may prevent the operation, damage the machine or cause personal injury.
- The machine is not in service mode.

To start:

1. Press the power on button.
2. Press the start button.

5.2.3 EMERGENCY STOP

Pressing the emergency stop button will stop the operation of all the machines in Tiny line immediately. All the output stages of PLC will drop down, stopping the motors and cutting the power off from relays and valves. Sensors are not affected by emergency stop.

Opening a hatch during normal operation activates e-stop circuit and stops the operation of the machine and two adjacent machines in Tiny line.

Emergency stop is not a normal stopping procedure. It should be used only in emergency situations.

5.2.4 STARTING AFTER EMERGENCY STOP

When starting after emergency stop:

1. Remove the cause for emergency stop.
2. Remove products from the machine.
3. Check machines functionality.
4. Release the emergency stop button by turning it clockwise.
5. Start as described in chapter 5.2.2 Normal start-up.

5.2.5 RESET

Press the Stop button in the GUI for 3 seconds to reset the machine.

5.2.6 NORMAL SHUT-DOWN

Press the Power off button to shut down the machine.

5.3 CONFIGURATION

This chapter includes the configurations carried out during normal operation.

Configuration:

1. Select product (See section 5.3.1)
2. Teach robot points to robot (See section 5.3.2)
3. Teach machine position in line (See section 5.3.3)
4. Configure log book (See section 5.3.5)

5.3.1 HOW TO SELECT PRODUCT

Click *Menu* → *Settings* → *Product* to open product management window.

5.3.1.1 Selecting product

Select desired product from the list and click the active button. The machine restarts when new product is selected.

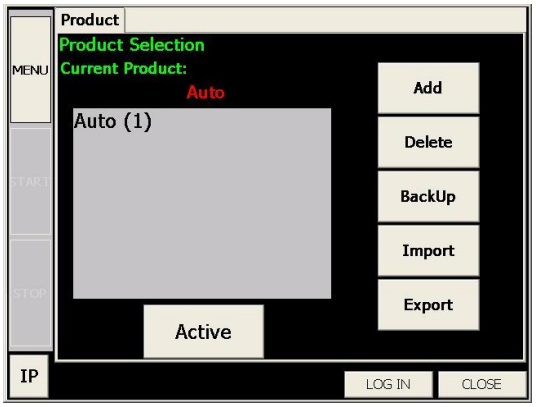


Figure 5.3-1 Settings window – Product sheet

5.3.1.2 Add (How to add new product)

To add a new product:

1. Click the *Add* button on the first page of the product sheet.
2. Select a source product from the list (Figure 5.3-2). The selected product will be copied to create new product.
3. Name the product, give it an id-number and click the create button. The id-number must lie between 1 and 9999.

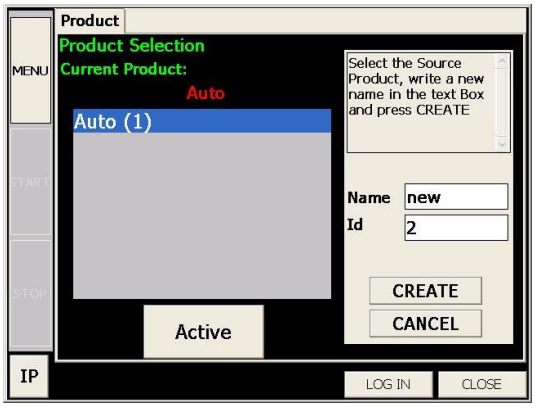


Figure 5.3-2 Add menu

5.3.1.3 Delete a product

To delete a product:

4. Open the first page of the product sheet.
5. Choose the product to be deleted.
6. Click the *Delete* button.
7. Choose the product to be deleted from the list (Figure 5.3-3).
8. Click the *Delete* button.

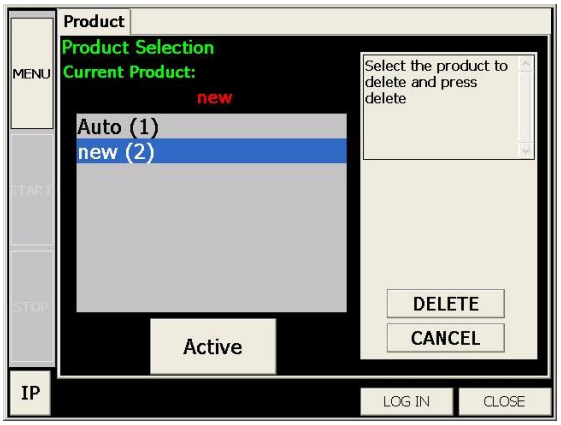


Figure 5.3-3 General settings window

Note

It is not possible to delete current product!

5.3.1.4 BackUp

BackUp function copies all the existing products into a memory stick.

Note

If a backup has been already created it will be copied over!

To create a backup copy:

9. Click the *Backup* button on the first page of the product sheet.
10. Insert an USB memory stick and click the *Backup* button (Figure 5.3-4).
11. A backup folder is created into the memory stick and the products are copied into backup folder.

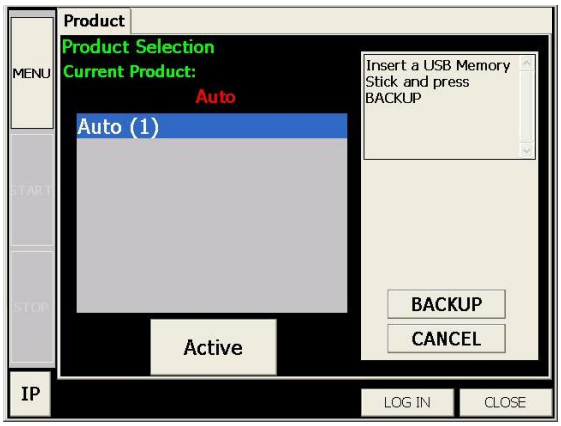


Figure 5.3-4 Backup

5.3.1.5 Import

Contact JOT Automation to order new products to import.

To import a product:

12. Click the *Import* button on the first page of the product sheet.
13. Create \Import\ directory into a memory stick and save the desired products into the directory.
14. Insert a memory stick into an USB port.
15. Click *Next*.
16. Select products from the import list and click the *Import* button (Figure 5.3-5).

The imported product is activated automatically.

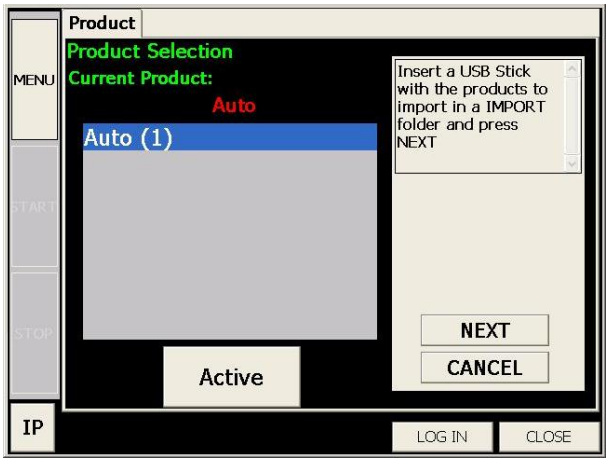


Figure 5.3-5 Import menu 1

5.3.1.6 Export

To export a product:

17. Click the *Export* button on the first page of the product sheet.
18. Create \Export\ directory into a memory stick.
19. Insert a memory stick into an USB port.
20. Click the *Export* button.
21. Select the desired products and click the *Export* button (Figure 5.3-6).

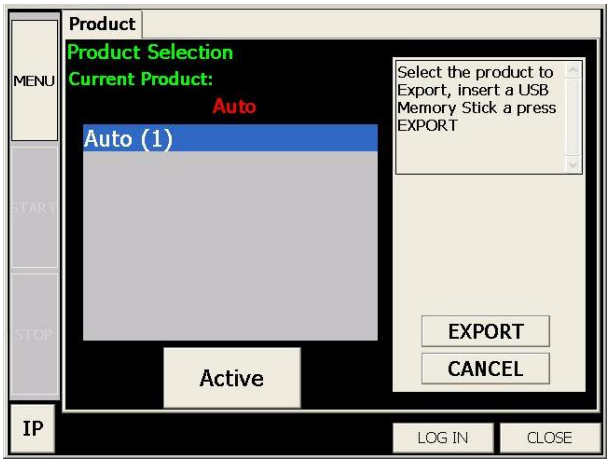


Figure 5.3-6 Export

5.3.2 HOW TO TEACH ROBOT POINTS TO PRODUCT

Robot points are taught with a wizard. Wizard starts with *Menu → Main → TinyService → Tiny Config → Run Wizard.*

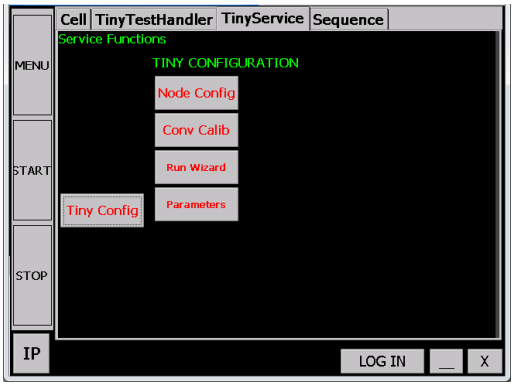


Figure 5.3-7 Main – Tiny Service

Follow the instructions given in the wizard windows.

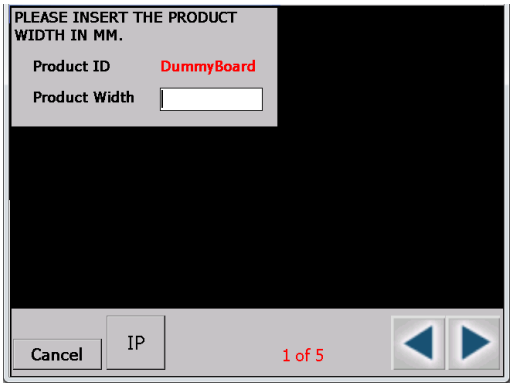


Figure 5.3-8 Insert product width

1. Insert product width and continue with arrow

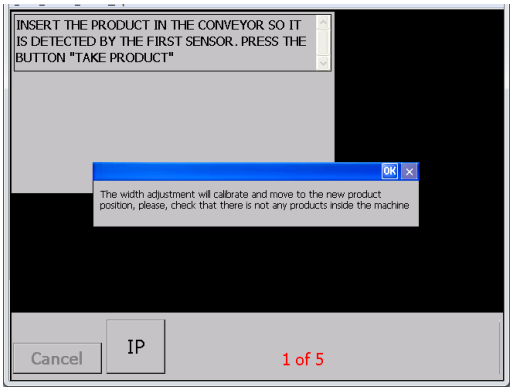

INSERT THE PRODUCT IN THE CONVEYOR SO IT IS DETECTED BY THE FIRST SENSOR. PRESS THE BUTTON "TAKE PRODUCT"
OK
The width adjustment will calibrate and move to the new product position, please, check that there is not any products inside the machine
Cancel
IP
1 of 5

Figure 5.3-9 Place the product on the conveyor

2. Check that there is no product inside the machine and close the prompt with OK button.

   Calibration is taken place.

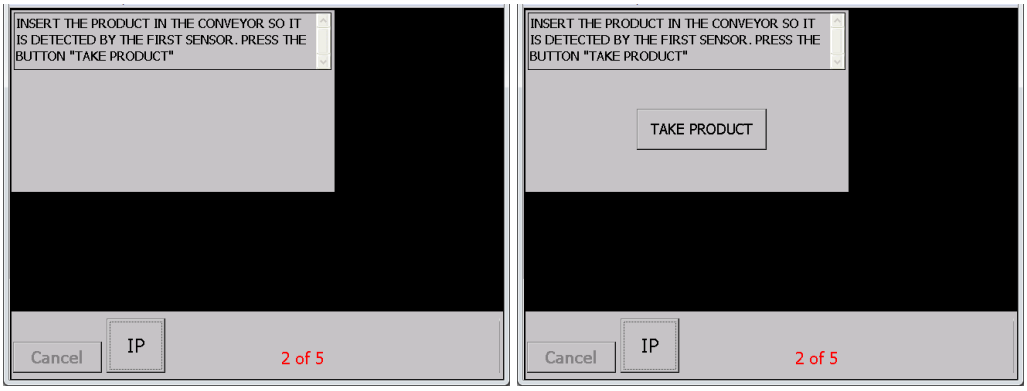

INSERT THE PRODUCT IN THE CONVEYOR SO IT IS DETECTED BY THE FIRST SENSOR. PRESS THE BUTTON "TAKE PRODUCT"
Cancel
IP
2 of 5
INSERT THE PRODUCT IN THE CONVEYOR SO IT IS DETECTED BY THE FIRST SENSOR. PRESS THE BUTTON "TAKE PRODUCT"
TAKE PRODUCT
Cancel
IP
2 of 5

Figure 5.3-10 Place the product on the conveyor

3. Place the product on the conveyor in the vicinity of the first sensor.

   Take product button appears when the sensor detects the product.

4. Click *Take product*

   The conveyor moves the product to the scanning position. *Take product* text turns grey and an arrow appears on the lower right corner.

5. Click the arrow to continue.

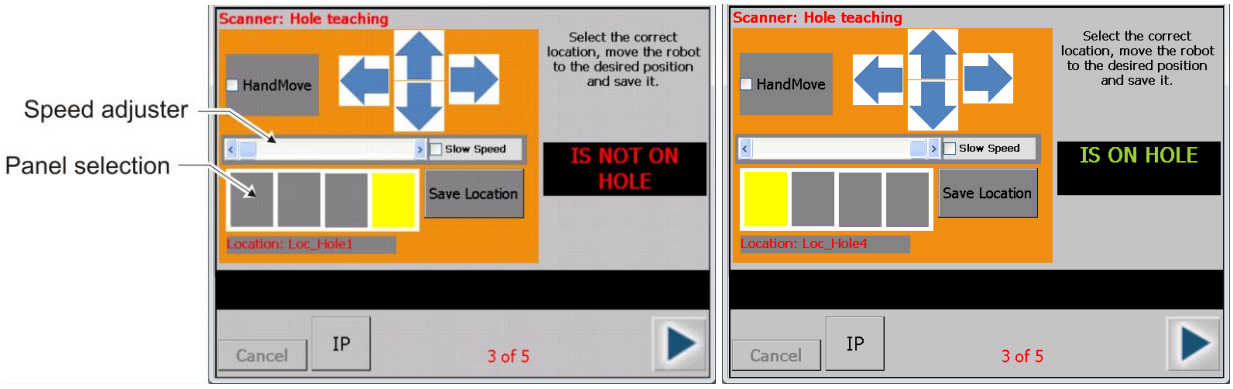


Figure 5.3-11 Hole teaching window

6. Teach a hole on the PCB to the laser sensor

   a. Move the laser pointer to a hole in the PCB with the arrow buttons.

      or

      You can also switch on the service mode with *Service key switch*, tick on the *HandMove* and move the robot by hands.

   b. When the laser sensor detects a hole IS ON HOLE text appepars.

   c. Save the location with the *Save Location* button.

   d. Teach other panels' holes. Select panels from the panel selection.

7. Continue with arrow.

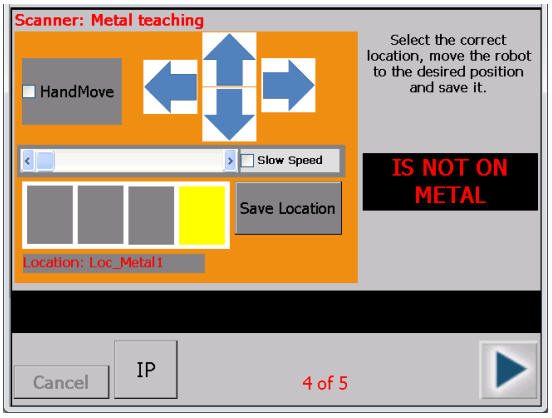


Figure 5.3-12 Metal surface teaching window

8. Teach metal surface on the PCB with the same methods as you taught hole.

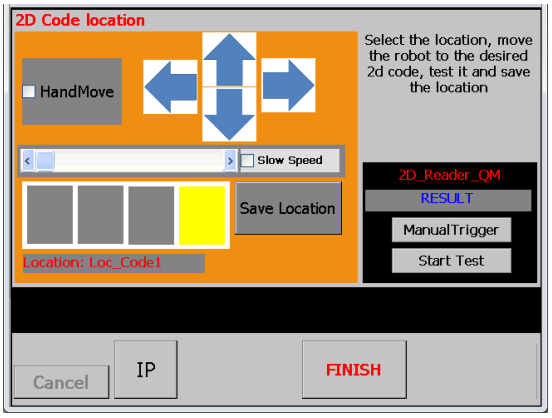


Figure 5.3-13 Code position teaching window

9. Teach the 2D code position to the reader with the same methods as you taught laser sensor. Blue cross shows the code reader position. Click *ManualTrigger* or *Start Test* to test the reader. *ManualTrigger* reads the code only once, when the *Start Test* tests also reading speed. Results are shown in the display. Fine tune the position to get reading speed close to 20 DEC/s.

10. Click *Finish* to end the wizard.

    Machine resets itself and loads the taught product.

5.3.3 HOW TO CONFIGURE MACHINE POSITION IN LINE (NODE AND IP-ADDRESS)

Click *Menu* → *Main* → *TinyService* → *Tiny Config* → *Node Config* to open product management window.

Define here:

- *Tiny line*
  Several lines may have been connected to the same LMS PC. Lines are separated with numbering.
- *Tiny zone*
  Line can include several zones. Zones are separated with numbering. Every zone includes one master Tiny.
- *Tiny Node*
  Location number of the machine in the zone.
  - Master machine is number 1.
  - First slave is number 2 etc.
  - Scanning Unit's node is 130
  - Fail Marker's node is 128
  - LMS PC's node is 129

Machines' IP-address is generated by means of line, zone and node numbers in a following way; **200.line.zone.node**.

Test PC's IP-address is generated from the Tiny's IP-address adding up 100 to the node number.

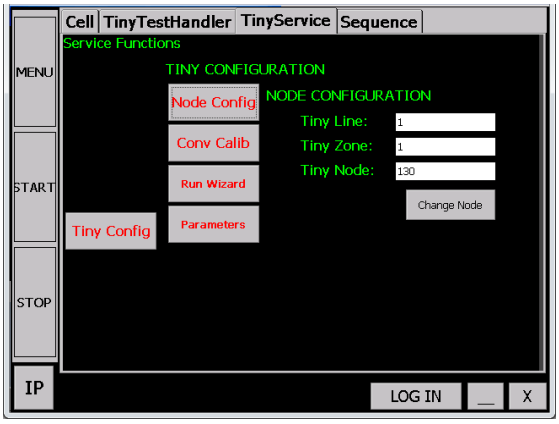


Figure 5.3-14 Node configuration

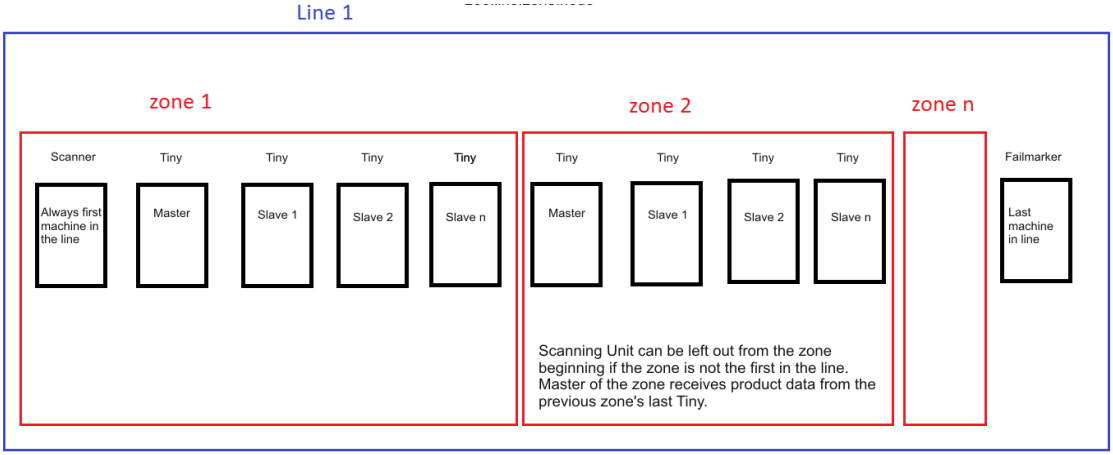


Figure 5.3-15 Lines, zones and nodes

5.3.4 HOW TO CORRECT ROBOT POINTS

If robot points taught with teaching wizard need correction, it can be done in Teaching window.

Click *Menu* → *Teaching* to open teaching window.

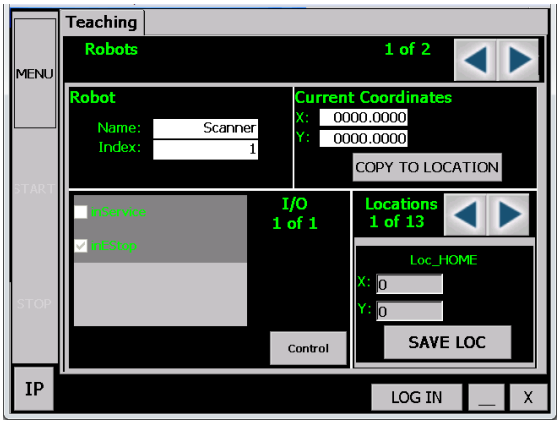


Figure 5.3-16 Teaching sheet

Robot field

Robot selection	Scrolls robots with the prev and next buttons.

Current Coordinates field

Displays current coordinates of the axis or the radius of the index table.

Copy to location	Copies coordinates or radius to the Location field.

Location field

Indicates saved axes or index point locations, names and positions.

Coordinates or radius are adjusted by copying the coordinates from the Current coordinate's field or by placing the cursor to the field.

Arrow buttons	Browses the Locations.
Save loc	Saves adjusted settings.

I/O field

In this field user can use predefined I/Os.

Find I/O list from the automation drawings.

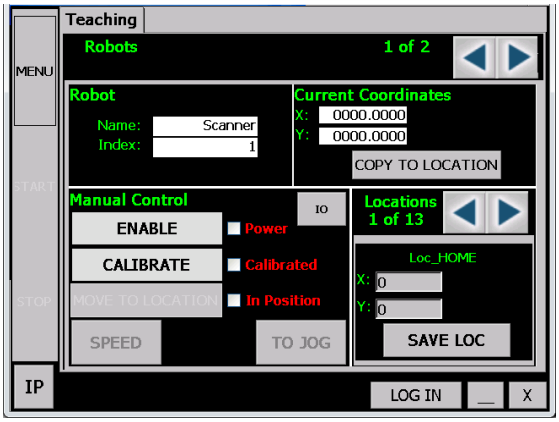


Figure 5.3-17 Teaching sheet

Manual Control field

Enable	Turns the actuator/robot power on and enables manual control. When the power in not enabled, the actuator/robot can be moved by hand to desired locations. After finding the desired location, press the Copy to location button and after that the Save loc button.
Calibrate	Executes calibration. Manual control must be enabled before executing calibration. The index table must be free and pusher cylinders up.
Move to location	Moves axis or index table to desired location picked in the Locations field. Manual control must be enabled and the calibration must be executed.
Speed	Set axis or index table speed. Click the robot button to return to the Manual control field.
Jog	Drive axis manually with the and up / down buttons. Click the control button to return to the Manual control field.

Figure 5.3-18 Speed and jog fields

5.3.5 HOW TO SELECT DATA STORED TO LOG

Selecting *Settings* → *Logging*, the data saved in the log files can be selected. The data available is Cycle times, Log errors, and Log results.

To select the logging data, enable the Logger on field, and choose the data for log files.

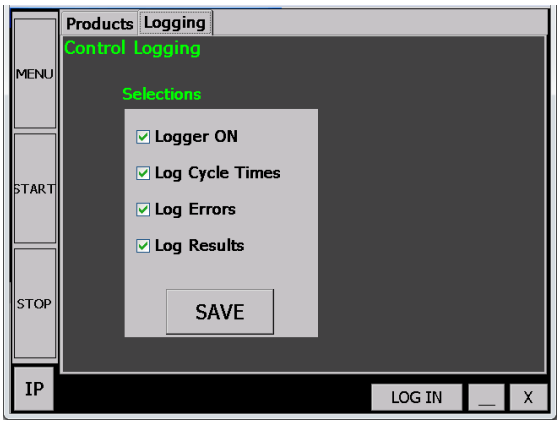


Figure 5.3-19 Logging window

5.3.6 ACTIVATE ERROR ON FAILED READING'

Click *Menu* → *Main* → *TinyService* → *Tiny Config* → *Parameters*

Select *No Read Error Active* if you want the machine to alarm and stop when code reading fails. In another case PCBS are just forwarded straight to the Fail Module Marker without testing.

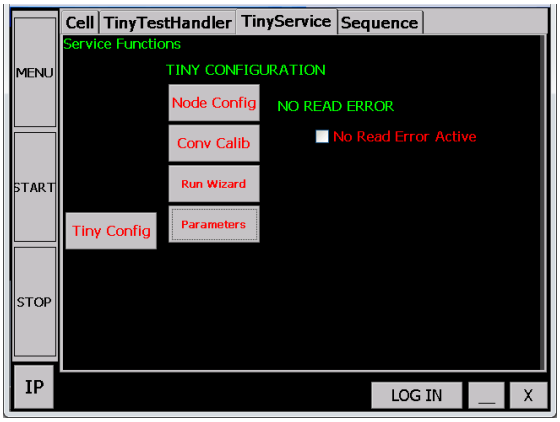


Figure 5.3-20 Conveyor calibration

5.4 CALIBRATION

5.4.1 CONVEYOR CALIBRATION

Click *Menu → Main → TinyService → Tiny Config → Conv Calib*

Conveyor calibration is carried out for example after mechanical maintenance or repair actions when the width may have changed.

Calibration is carried out by means if a wizard.

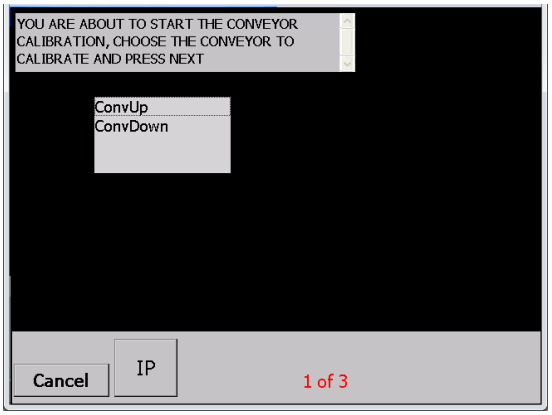


Figure 5.4-1 Conveyor calibration

1. Select conveyor. In Scanning Unit there is only one conveyor.

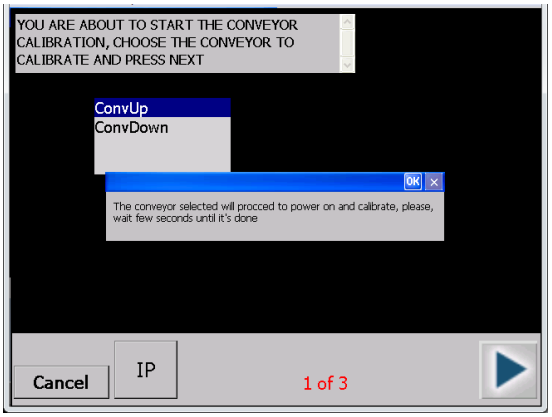

YOU ARE ABOUT TO START THE CONVEYOR CALIBRATION, CHOOSE THE CONVEYOR TO CALIBRATE AND PRESS NEXT
ConvUp
ConvDown
OK
The conveyor selected will procced to power on and calibrate, please, wait few seconds until it's done
Cancel
IP
1 of 3

Figure 5.4-2 Conveyor calibration 2

2. Click arrow to continue and close the prompt with ok.

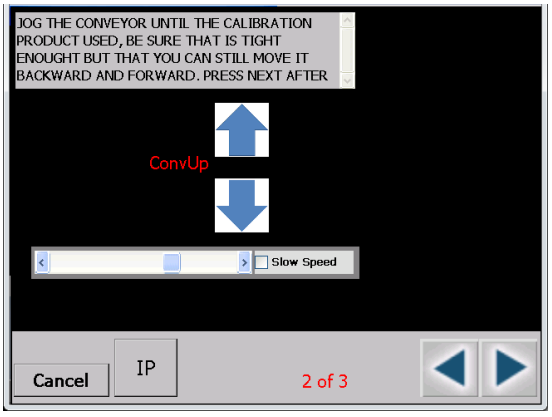

JOG THE CONVEYOR UNTIL THE CALIBRATION PRODUCT USED, BE SURE THAT IS TIGHT ENOUGHT BUT THAT YOU CAN STILL MOVE IT BACKWARD AND FORWARD. PRESS NEXT AFTER
ConvUp
Slow Speed
Cancel
IP
2 of 3

Figure 5.4-3 Conveyor calibration 2

3. Adjust speed up to maximum

4. Start driving the width with arrow buttons. When the width appears to be close the correct, adjust the speed lower and fine tune the width with the calibration product.

   The width is correct when there is no backlash between the calibration product and the conveyor edges and the calibration pallet moves easily along the conveyor.

5. Continue with the arrow button

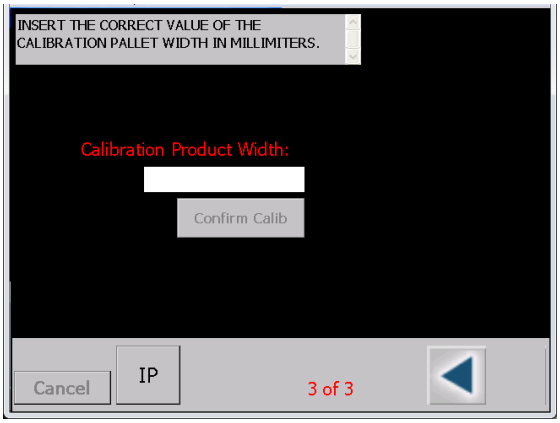


Figure 5.4-4 Enable power and calibrate

6. Insert actual width of the calibration product.

7. Confirm calibration

5.5 CONTROL AND MONITORING

This chapter includes instructions for control and monitoring GUI windows.

5.5.1 MONITORING DUT STATUS

Tiny Test Handler Status Page displays serial number of the DUT, current status and pass/fail-data. Current status is e.g. initializing, initialized, reading 2d codes, acquiring pcb information, marking, driving pcb out.

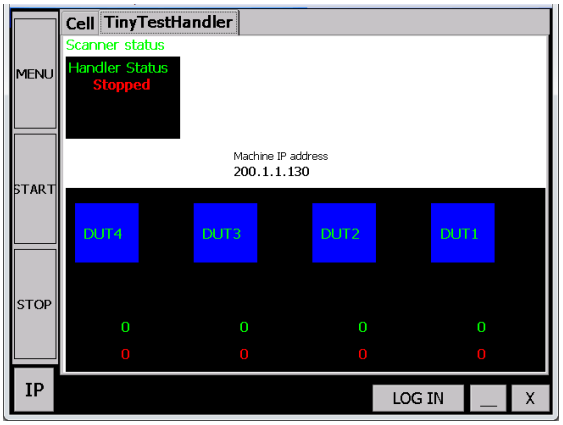


Figure 5.5-1 Status page

5.5.2 MONITORING CELL INFORMATION

Cell page displays status code, product name, cycle time, and error code.

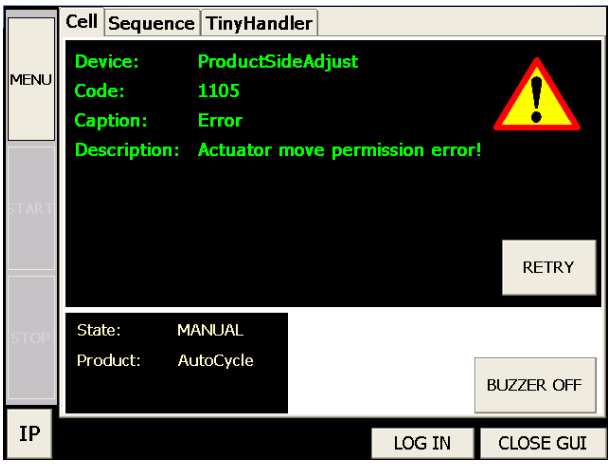


Figure 5.5-2 Cell sheet with an error

Arrow butons	Use to browse error codes if several errors appear.
Retry	Use to retry start after an error.

5.5.3 SEQUENCE MONITORING

The sequence sheet displays status of the running sequences.

The displayed sequences may be helpful e.g. when tracking a malfunction.

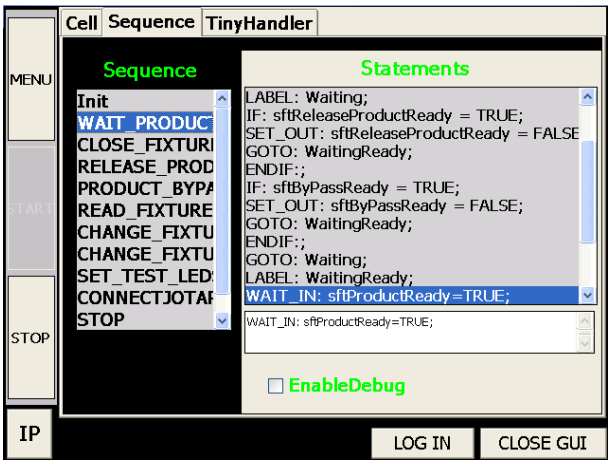


Figure 5.5-3 Sequence window in operation state

5.5.4 MANUAL CONTROL

In the Manual control window the actuators can be driven manually. Browse more actuators with the previous and next buttons.

The GUI does not check the chosen actions from the user before carrying them out. Operator or the cell might be harmed if precautions are not used.

5.5.4.1 Manual control – Manual (Actuators)

Product stopper can be used manually with *Extend* and *Retract* buttons.

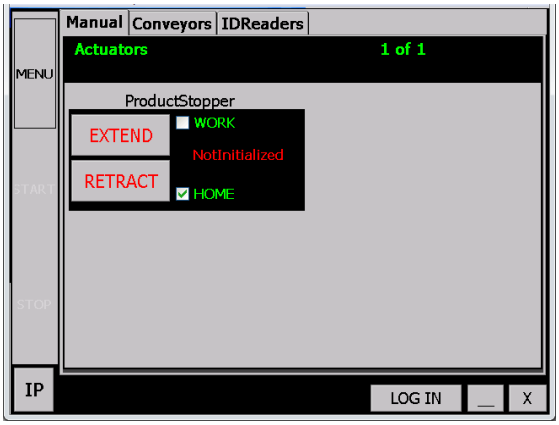


Figure 5.5-4 Manual control of product stopper

5.5.4.2 Manual control – Conveyors

In this window conveyors can be driven manually.

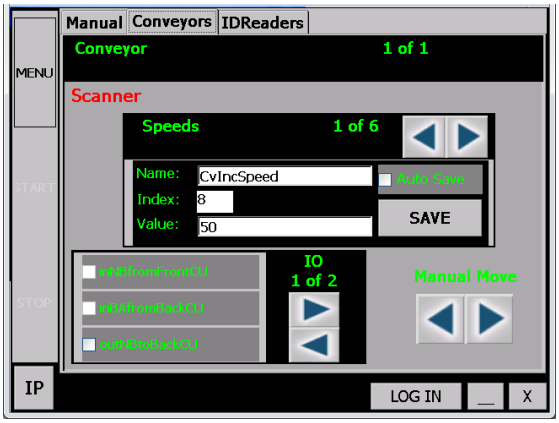


Figure 5.5-5 Manual control of conveyors

5.5.4.3 Manual control – IDReaders

In this window you can test code reader manually.

ManualTrigger reads the code only once, when the *Start Test* tests also reading speed.

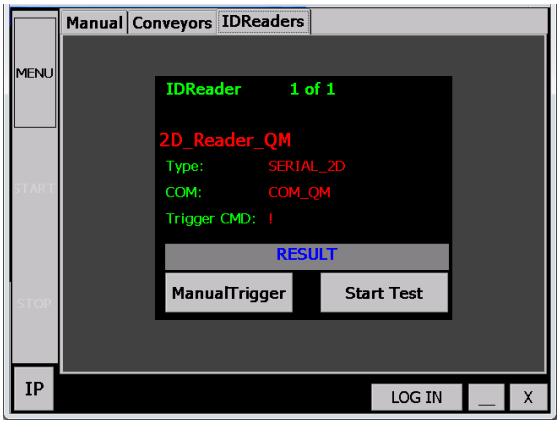


Figure 5.5-6 Manual control of conveyors

5.5.5 I/O CONTROL

In the analog sheet the analog inputs can be monitored and analog outputs can be set. The inputs are displayed on the upper panel and the outputs are displayed on the lower panel. Both panels include arrows for scrolling through the groups.

The GUI does not check the chosen actions from the user before carrying them out. Operator or the cell might be harmed if precautions are not used.

Find I/O-list from the attached automation drawings.

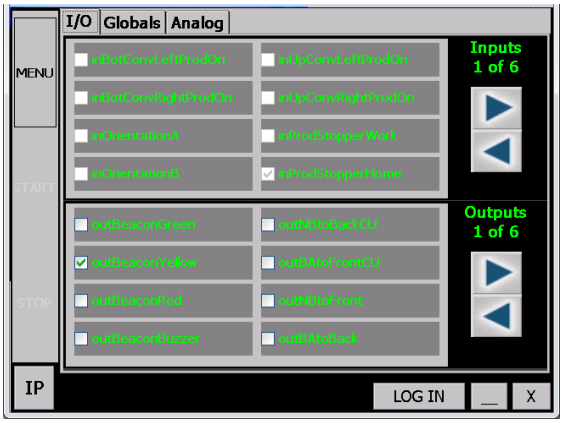


Figure 5.5-7 I/O sheet

5.5.6 GLOBAL VARIABLE CONTROL

With the global sheet the global variable values can be monitored and modified.

- Options for variable type are Integer, Real and String.
- To add new parameters click the add button.
- To browse parameters use arrow buttons.

An auto save option can be used for the variable types integer and real. Values will be automatically saved after each change if the auto save option is ticked.

The GUI does not check the chosen actions from the user before carrying them out. Operator or the cell might be harmed if precautions are not used.

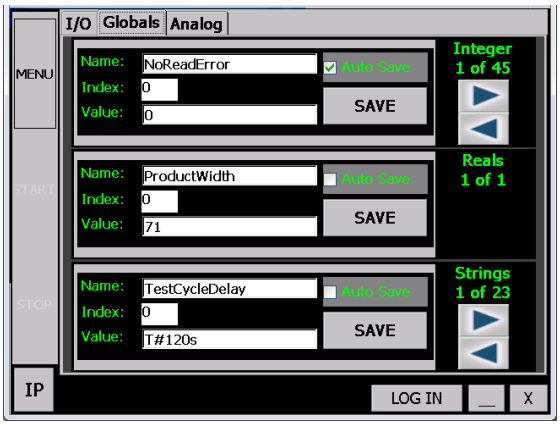


Figure 5.5-8 Global variables sheet

5.5.7 ANALOG VARIABLE CONTROL

In the analog sheet the analog inputs can be monitored and analog outputs can be set. In practice you cannot set outputs because the machine is automatically controlled.

Browse more parameters with arrow buttons.

The GUI does not check the chosen actions from the user before carrying them out. Operator or the cell might be harmed if precautions are not used.

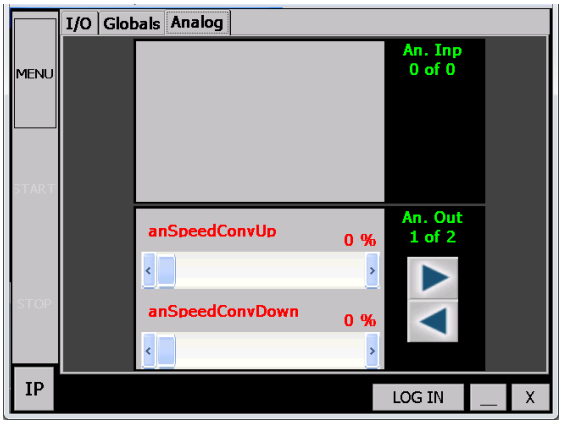


Figure 5.5-9 Analog sheet

6 MAINTENANCE

6.1 PREPARATIONS FOR MAINTENANCE 2
6.1.1 Detergents 2
6.1.2 Lubricants 2
6.1.3 Working area 2
6.2 MAINTENANCE SCHEDULE 3
6.3 MAINTENANCE PROCEDURES 3
6.3.1 General condition and function 3
6.3.2 Cleaning 4
6.3.3 Ball screws and linear motion guides 4
6.3.4 Pneumatics 4
6.3.5 Cogged belt and pulleys 5
6.3.6 Sensors 5
6.4 RETURNING TO OPERATING MODE 6

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6 MAINTENANCE

These instructions are only meant for specially trained maintenance personnel. Use extreme care when working while the protective covers have been removed.

Note

Only qualified electrician is permitted to open maintenance hatches.

6.1 PREPARATIONS FOR MAINTENANCE

Before starting maintenance, perform following preparations in order to maintain the machine as easily, safely, and efficiently as possible:

- Select tools.
- Study carefully:
  - Safety instructions.
  - How to reach the maintenance targets.
  - How to perform the maintenance operation.
- Separate the working area e.g. by a colorful rope.

In order to replace a component:

- Make sure new component is similar to the one to be replaced.
- Remove products remaining in the machine.

For automation documents (circuit diagrams and program disk) see chapter 8 Appendices.

6.1.1 DETERGENTS

For general cleaning of the outer surface, use mild universal cleanser.
For removing grease, use universal grease-remover, e.g.:

- LUNGE-SUPER or
- WÜRTH PRO-CLEAN (or comparable).

6.1.2 LUBRICANTS

Recommended greases for ball screws and linear guideways:

- HIWIN G05
- Klüber Klüberlub GL-261
- Mobil Mobilux EP1
- Fuchs Lubritech Lagermeister BF2
- Lubcon Turmogrease CAK 2502

6.1.3 WORKING AREA

Reserve enough free space around the unit for maintenance procedures.

6.2 MAINTENANCE SCHEDULE

The maintenance schedule below is meant for single-shift work. If the machine is used in several shifts shorten the maintenance interval.

If accumulating dust/dirt in a process causes risk to the product or the machine, clean the machine daily.

Weekly maintenance

- Check general condition and function (6.3.1).
- Clean outer and inner surfaces (6.3.2).
- Empty water separator (6.3.4).
- Check and clean sensor lenses, and laser sensor lens (6.3.7).

Monthly maintenance

- Clean and lubricate ball screws and linear guide ways (6.3.3).
- Check cogged belt and pulleys. Replace if necessary (6.3.5).
- Check air supply filter. Replace if necessary (6.3.4).
- Check pneumatic valve silencers. Replace if necessary (6.3.4).

6.3 MAINTENANCE PROCEDURES

Warning

Switch the mains off before starting the maintenance!

It is advisable to unplug the main power contact of the machine before starting the maintenance operation.

6.3.1 GENERAL CONDITION AND FUNCTION

As far as the automation parts are concerned, visually check the cables, sensors, motors, etc. Make sure that the cables are undamaged. Also pay attention to the temperature and smell of the components.

Check the door mechanism and other components in the machine and make sure they move properly. Operate all the functions manually.

Observe the operation of the machine. Make sure it operates smoothly without any jerking movements or unusual sounds.

When noticing (seeing or hearing) a defect in the machine, immediately take necessary actions to prevent any damage and find out the fault. Refer to chapter 7 Troubleshooting.

6.3.2 CLEANING

Use only a lint-free cleaning tissue for general cleaning of the outer surface, and if needed, mild universal cleaner.

Caution

Do not use abrasive cleaning powders or solvents!

6.3.3 BALL SCREWS AND LINEAR MOTION GUIDES

6.3.3.1 Lubricating linear motion guides

1. Clean the guides with a lint-free cloth and lubricate lightly. Apply lubricant to lubrication connection of the block or straight on the rail.
2. Drive the block back and forth three times with the GUIs manual control.
3. Repeat lubricating and driving twice.
4. If a lubricant film cannot be seen on the profile, increase lubricant quantities.

Caution

Excessive quantities of lubricant may damage the parts.

For recommended lubricants see chapter 6.1.2. Lubricants.

6.3.3.2 Lubricating ball screws

1. Clean ball screws with a lint-free cloth and lubricate lightly. Apply lubricant to lubricating connection of the nut or straight on the screw.
2. Drive the nut back and forth three times with the GUI's manual control.
3. Repeat lubricating and driving twice.
4. If a lubricant film cannot be seen on the ball screw, increase the lubricant quantities.

Caution

Excessive quantities of lubricant may damage the parts.

For recommended lubricants see chapter 6.1.2. Lubricants.

6.3.4 PNEUMATICS

6.3.4.1 Emptying the water separator

To empty the condensed water from the service unit:

1. Open the valve under the water separation bowl.
2. When the bowl is empty (compressed air starts to whistle out), close the valve.

6.3.4.2 Replacing air supply filter

Replace air filter if you notice decrease in air pressure.

To replace a filter:

1. Stop the flow of compressed air.
2. Screw off the water separation bowl.
3. Screw off the plastic nut under the filter.
4. Replace the filter element.

6.3.4.3 Replacing silencers

Check condition of the valve silencers. Every control valve or valve package contain a silencer or several silencers. In scanning unit the silencers are located in the stoppers valve. Grey colour or an extraordinary sound when disconnecting pressure signifies clogging or damage. Replace clogged or damaged silencer.

Figure 6.3-1 Examples of valve silencers

6.3.5 COGGED BELT AND PULLEYS

Check the condition of the cogged belt and cogged belt pulleys.
Replace worn, faulty or loose belt and damaged pulleys.

6.3.6 SENSORS

Clean sensor lenses with a dry lens cloth if necessary. Avoid unnecessary cleaning. Wipe dust off carefully. Do not use solvents.

6.4 RETURNING TO OPERATING MODE

After finishing maintenance:

- Close opened hatches and mount the removed cover plates.
- Check that all cables and clamps are correctly connected and fastened.

Perform the final inspection after the maintenance acceptance.
Pay special attention to the following issues:

- Tightness of the cables: the cables must not hang, lie on the floor or be in touch by a moving element.
- Cleanliness of the device and the working area.
- The maintenance switches have been returned to the normal operation mode.
- Pneumatic supply has been connected.
- The machine is tested according to test instructions in Installation manual.

When maintenance operations are completed turn the service switch to the 0-position and perform starting procedures as described in the operation manual.

7 TROUBLESHOOTING

7.1 ALARM HANDLING 2
7.2 UNEXPECTED DAMAGES 2
7.2.1 Mechanical damages 2
7.2.2 Water damage 3
7.2.3 Fire 3
7.3 RECOVERY FROM PROGRAM LOSS 3

7 TROUBLESHOOTING

This chapter includes troubleshooting guide and instructions on how to handle unexpected damages. The troubleshooting guide is for trained service personnel only.

7.1 ALARM HANDLING

Most common errors:

10200	"PCB is in the WRONG orientation, please take out the PCB and press retry"
10202	"Scanner has count 4 no reads in a row, please check the reading places and the scanner before continue "
10203	"Scanner could not read a 2D code in the board, please take the board out, inspect it and retry"
10105	"Door is open, please close the door."

7.2 UNEXPECTED DAMAGES

7.2.1 MECHANICAL DAMAGES

Note

If the machine is displaced by some reason, it is utterly important to check the condition of the power cord. A damaged cord may cause an electric shock!

Only a qualified electrician may inspect the machine.

If an external force causes a visible change in the shape of the machine:

- Turn the mains off immediately.
- Unplug the power cord.
- Be careful not to touch the machine due to a risk of electric shock.
- Pay special attention to any damaged electrical components in the control system.

The machine must not be used if:

- there is any possibility of a risk of electric shock or
- a component containing voltage is damaged

7.2.2 WATER DAMAGE

In case of water damage:

1. Turn the mains off immediately.
2. Unplug the power cord.
3. Be careful not to touch the machine due to a risk of electric shock.

Only a qualified electrician may inspect the machine for moisture and make sure it can be safely used before it is started. The power must be prevented from being turned on before and during the inspection.

There is always a huge risk of an electric shock. If the inspection indicates that the machine is dry and not damaged, it may be operated normally.

If noticing moisture damages contact JOT Automation Field Service.

7.2.3 FIRE

Press the Emergency Stop button and follow the internal procedures of your company or organization for an emergency situation. If fire occurs, use a CO_2 fire extinguisher.

7.3 RECOVERY FROM PROGRAM LOSS

It is advisable to create a backup copy of all the existing products. Refer to chapter 5.3.3.4 BackUp.

In the case of program loss, import the backup copy. Teach locations manually. If this does not help, contact JOT Automation.

8 APPENDICES

8.1 RECOMMENDED SPARE PARTS 2
8.2 HOW TO ORDER SPARE PARTS 3
8.3 WARRANTY 3
8.4 DECLARATION OF CONFORMITY 4
8.5 DRAWINGS 4
8.6 SMEMA HANDSHAKING STANDARD 4

8 APPENDICES

8.1 RECOMMENDED SPARE PARTS

Spare part code	Part	Type	Class
2200017020_0	Bulb	Ba15D 16x35 24V 125mA 3W	3
ACC06140_0	Mounting bracket	IGUS 0450.20.12	3
ACC06198_0	Energy transfer chain	IGUS 0.585m 045.20.038.0	3
ACC071_0	Door switch	1 opening/closing contact	2
BEA06186_0	Deep groove ball bearing		2
BEA068_0	Ball bearing 6		2
CON01145_0	Driver, Brushless DC motor	1.5A RXBL1,5PR	1
CON02123_0	Servo Controller	Faulhaber MCBL3006C-3085	1
CON04265_0	Serial interface	RS232 Beckhoff EL6001	3
CON04271_0	Feed terminal	24VDC Beckhoff EL9100	3
CON04275_0	EtherCAT Coupler	Beckhoff, EK1100	3
CON04283_0	Digital output terminal	8ch 24 VDC 0,5A	3
CON0990_0	2-D Reader	Quadrus MINI FIS-6300-1002G	3
CON10121_0	Analog output terminal	0-10vdc, 4-channel	3
CON10134_0	Digital Input terminal	8-ch 24vdc 3 ms	3
CON10165_0	Can open	Beckhoff EL6751	3
DIA0111_0	Key switch, NC+NO	D16mm Round plate	3
DIA0168_0	Membrane terminal	Model 2001, Buttons JMT-11	1
DIA0191_0	Contact block		2
DRI06495_0	Timing belt	T2,5-6_145	2
DRI06532_0	MXL 2,3mm belt 498	MXL 2,3mm belt 498	1
DRI06664_0	Toothed belt	6T2,5/915	1
ELE0444_0	Relay, Interface	Murrelektronik, code 52003	1
ELE0472_0	Safety relay	Duelco NST-3.2CL 24VAC/DC	1
ELE0628_0	DC-DC converter	6W / 24 VDC - 5VDC	2
ELE06331_0	Power supply	24VDC/80W/3.3A	1
EM049211_0	Spline bushing	BEA01383 / Misumi TSPHB8	3
EM051632_0	Roller Assy		2
MOT0279_0	DC-Brushless Gearmotor	12W, 24V, Gear 19:1 MAXON	1
MOT03100_0	Brushless DC-Servomotor	36W, 24V, gear 14:1	2
MOT03101_0	Brushless DC-Servomotor	101W, 24V	2
OM015583_0	Belt pulley	16-T2,5-20-2	3
OM015871_0	Ball screw and nut		3
OM016838_0	Belt pulley	16 T2,5 / 12-2	3
P50751_0	Valve, magnetic	5/3 SMC SY3420-5LOU-M5	3
PNE011170_0	Mount Cylinder	double acting	3
PNE07112.0	Filter regulator	Festo LFR-1/8-D-MINI 159630	3
SEN0211_0	Photo cell, PNP	Omron E3Z-D81	1
SEN02202_0	Digit Amplifier Laser-sensor	PNP Keyence LV-21AP	1
SEN0229_0	Fork sensor (U shape)	OMRON, EE-SX871P (PNP)	1
SEN02301_0	Coaxial sensor, laser	max 600 mm	1
SEN0357_0	Solid-state switch	SMC D-M9PL PNP	1
TDIA024_0	Emergency stop actuator	EAO 61-3440.4/1+ 51-910	2

Table 8.1-1 Recommended spare parts

Explanation for Categories:

1st class

- These parts are critical in functional perspective of the machine.

2nd class

- Wearing is dependent on utilization rate.

3rd class

- These parts are less critical.

8.2 HOW TO ORDER SPARE PARTS

In order to purchase spare parts kindly contact:

spareparts@jotautomation.com
Phone: +358 10 301 5000
Fax: +358 8 344 425

Before ordering spare parts or requesting maintenance, see product type (Product), serial number (S.No) and project number (No) from the rating plate.

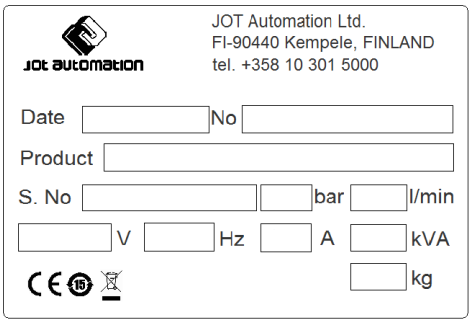


Figure 8.2-1 Rating plate

8.3 WARRANTY

JOT Automation Ltd. ("JOT") warrants that the products supplied by JOT, excluding any products provided by the customer, are free from defects in material or workmanship for a period of twelve (12) months from the date of the final acceptance of the product or (if no separate final acceptance procedure is used) from the date of installation of the product. However, the maximum warranty period is eighteen (18) months from the date of delivery of the product from JOT factory.

If during the warranty period a product is found to have an aforementioned defect, JOT shall repair or replace, at its discretion, such product or its part within a reasonable time. Products or parts repaired or replaced by JOT under the warranty including labour shall be warranted for the remainder of the original warranty period of the product. On request defective parts shall be delivered to JOT or stored for later inspection. The title to defective parts shall transfer to JOT upon delivery of the replacement part.

Condition for this warranty is that a written notification is provided to JOT within thirty (30) days from the discovery of the defect with a detailed product information and explanation of any alleged deficiencies, and that such product is made available for JOT's inspection. JOT shall make the final determination as to the existence and cause of any alleged defect.

The warranty covers only parts and labour. Customary lodging and travel expenses resulting from the warranty work shall be paid by the customer.

Excluded from the warranty are the following:

(a) normal wear and tear and consumable parts;

(b) defects attributable to the operation and maintenance of the product that is erroneous, incorrect, in-adequate or contrary to the operating instructions;

(c) defects attributable to environmental conditions or a change in conditions that is detrimental or hazardous to the product operation;

(d) defects attributable to the product being repaired and/or installed and/or modified by someone other than JOT or an authorized representative of JOT, or contrary to instructions given by JOT or an authorized representative of JOT; and

(e) defects attributable to third party products.

The warranty shall be void if the product is without JOT's prior written consent:

(a) dismantled and/or reinstalled; or

(b) resold to a third party.

No warranty is made with respect to custom products or products produced to customer's specifications except as specifically stated in writing by JOT in the contract for such custom products.

These terms shall be applied worldwide.

JOT MAKES NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, AND JOT EXPRESSLY EXCLUDES AND DISCLAIMS ANY WARRANTY OF MERCHANTABILITY, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE.

JOT SHALL NOT BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL OR OTHER SIMILAR INDIRECT DAMAGE AND THE LIABILITY OF JOT SHALL NOT UNDER ANY CIRCUMSTANCES EXCEED THE PURCHASE PRICE OF THE PRODUCT.

8.4 DECLARATION OF CONFORMITY

Find Declaration of Conformity attached after this page.

8.5 DRAWINGS

Find mechanical drawings at the back of this document.

8.6 SMEMA HANDSHAKING STANDARD

Find SMEMA handshaking standard at the back of this document.

JOT automation

CE

DECLARATION OF CONFORMITY

According to Directive 2006/42/EC

We,

JOT Automation Ltd.
Vihikari 10
FI - 90440 KEMPELE
FINLAND

declare under our sole responsibility that the product

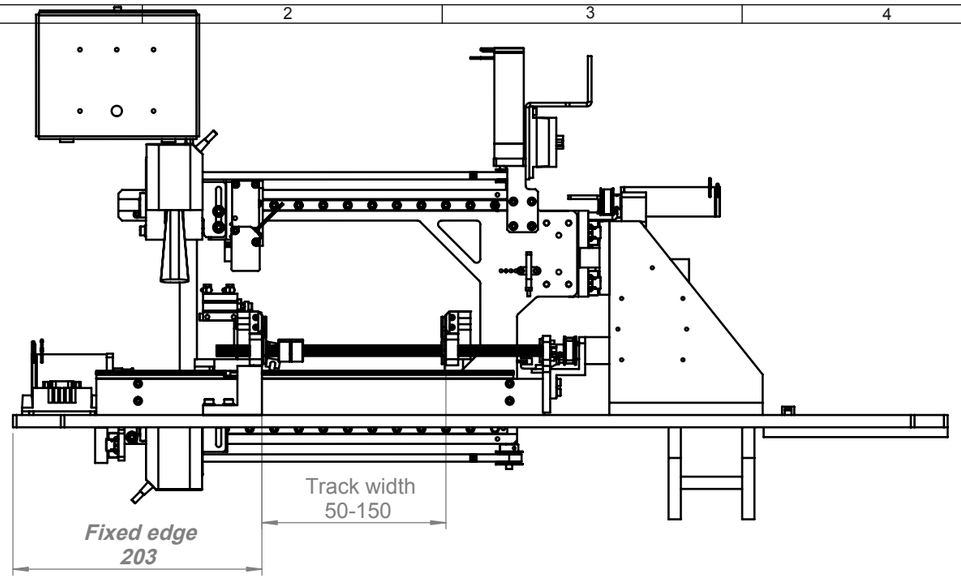
Name:	**Scanning Unit for Tiny Line**
Type:	**J002-872**
Version	**1**
Serial Number	**(if applicable)**

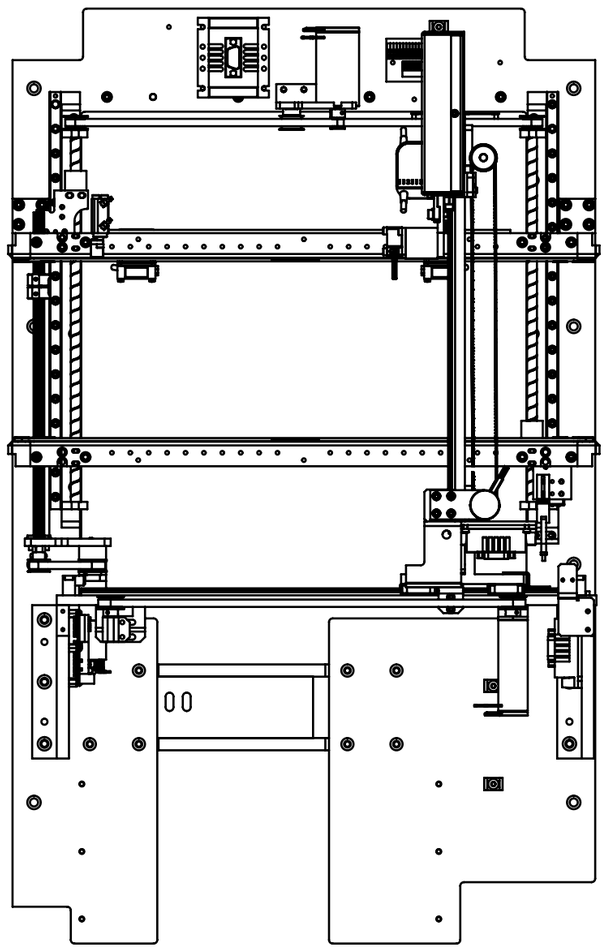
to which this declaration relates is in conformity with the following standards or other normative documents

Directive:	**2006/42/EC**
Other Directives:	**2004/108/EC**
Standards:	**SFS-EN ISO 12100-1, -2** **EN 60204-1** **EN 61000-6-4**

Oulu, 2 December 2011

Mika Puttonen
R & D Director
JOT Automation Ltd.





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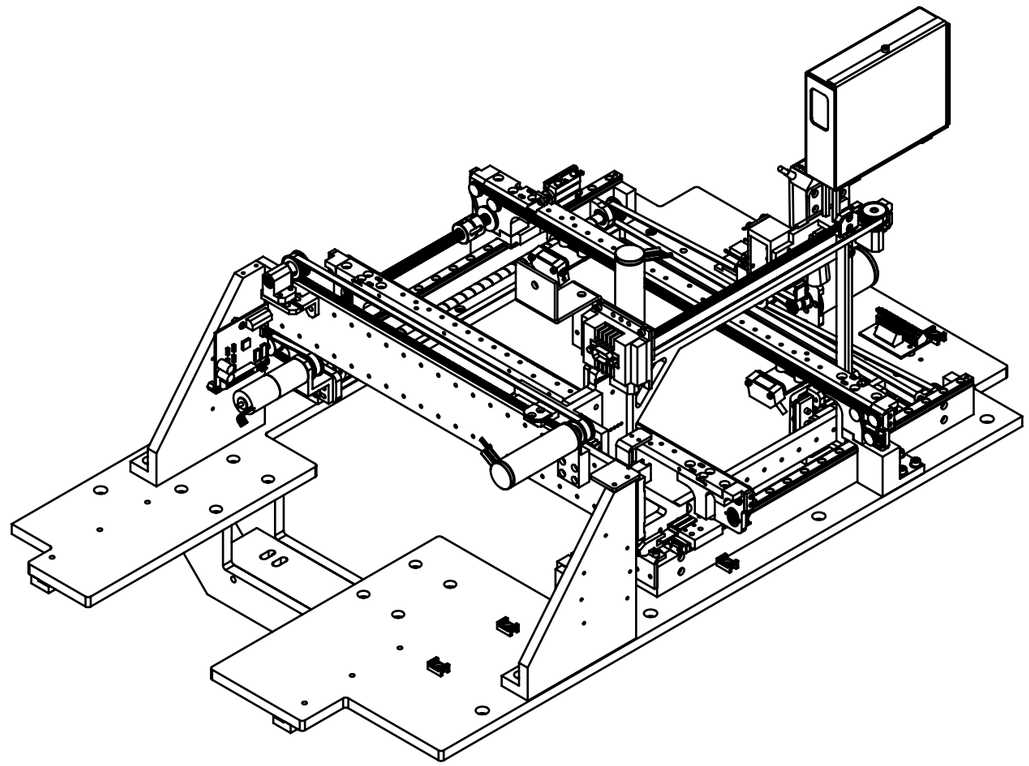

Rev:	Revision note:	Designed	Drawn
1	Update	unknown1 22.10.2011	
2	Added hose clamps	unknown1 18.11.2011	

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14	ACC0687	0	Suojaletku, Ulko-D 21.2	Musta polyamidi PA6	1	P	
13	ACC0690	0	Cable hose bracket, D 21.2	Black polyamide	4	P	Mec
12	ACC0687	0	Suojaletku, Ulko-D 21.2	Musta polyamidi PA6	1	P	
11	MAC10026	0	Plate washer	ALE 3,2A DIN125	2		Mec
10	MAC01461	0	Hex socket head cap screw	M3x12 DIN 912 SM	2		
9	MAC0577	0	Cylindrical pin	5m6x18 DIN 7	3	P	Mec
8	TMAC0135	0	Hex socket head cap screw	M4x16 DIN 912 SM	4		
7	MAC10028	0	Plate washer	ALE 4,3A DIN125	8		Mec
6	MAC01480	0	Hex socket head cap screw	M4x14 DIN 912 SM	8		
5	OM017831	0	XY-axis assembly	Scanner unit	1	A	Mec
4	OM017751	0	Sensor mounting assembly		1	A	Mec
3	OM017749	0	Conveyor assembly	Conveyor Fail marker	1	A	Mec
2	OM019348	0	Transmission assembly		1	A	Mec
1	OM017716	0	Base assembly Fail marker		1	A	Mec

Revision note: Created

Standard:

Designed: unknown1 29.10.2010

Drawn: lamsjuh 18.11.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT automation

XY axis assembly with conveyor
Scanner unit

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:5	69.77		1/3	OM017832.0	2

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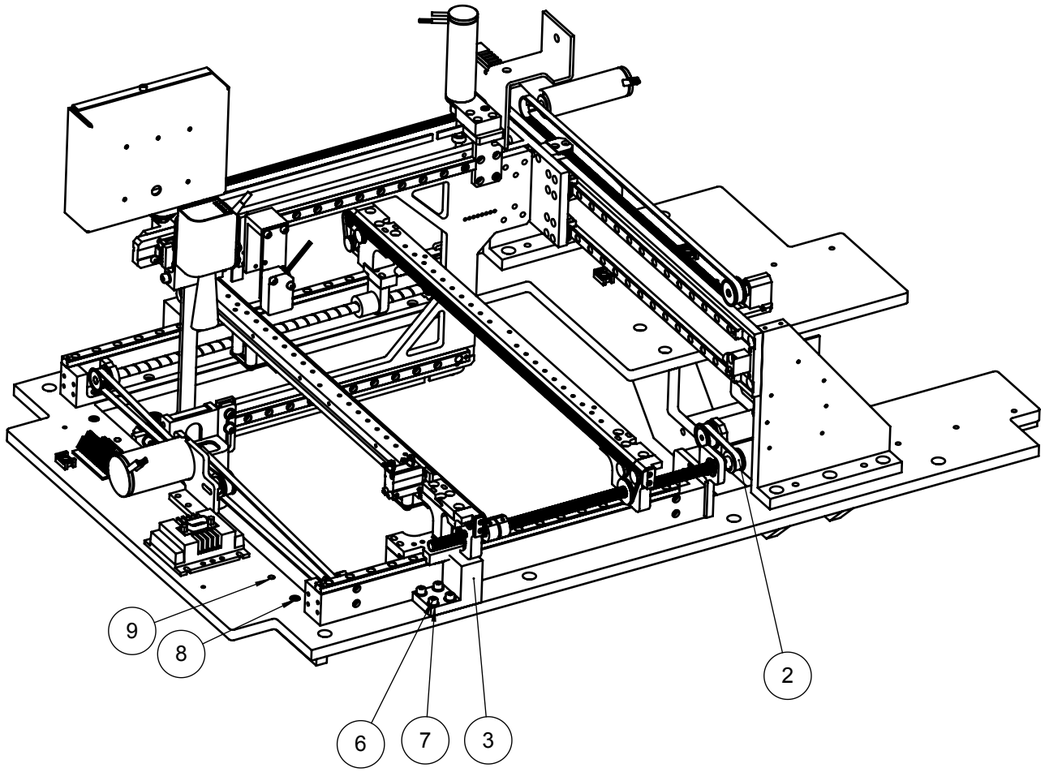
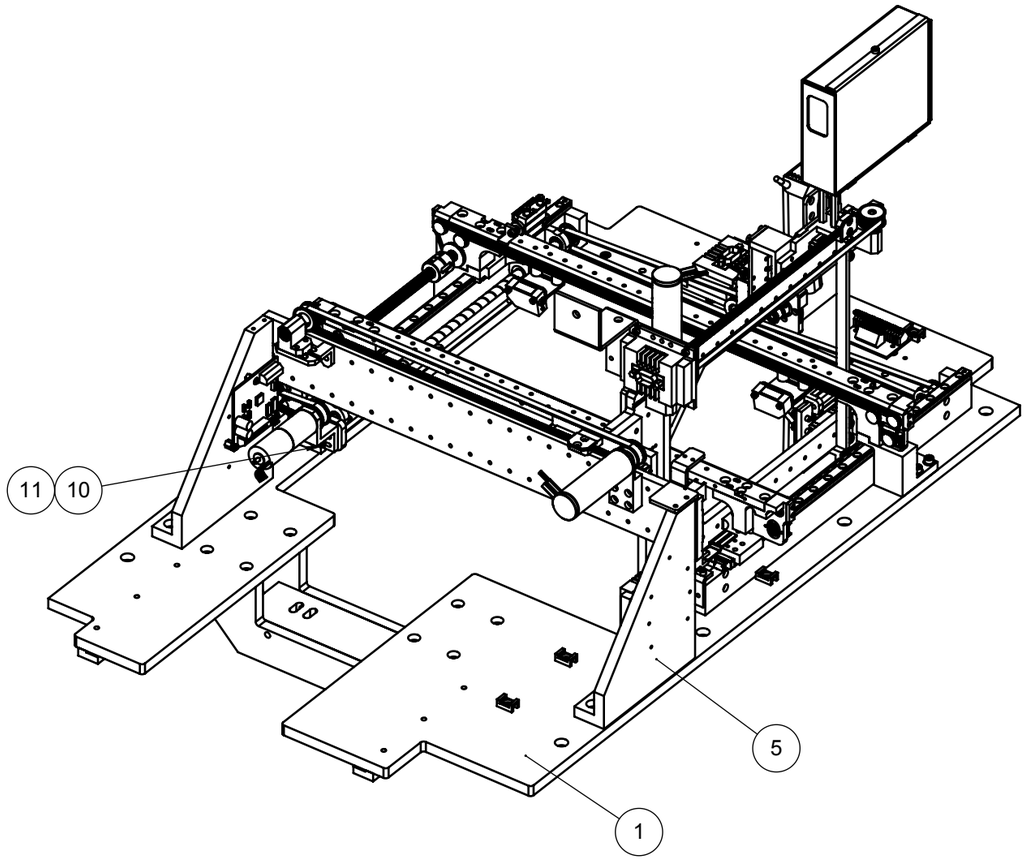
2	Added hose clamps	unknown1 18.11.2011	





Revision note: Created

Standard:	Designed: unknown1 29.10.2010	Material: Unspecified
	Drawn: lamsjuh 18.11.2011	Finish: Unspecified
RoHS:		XY axis assembly with conveyor Scanner unit
Copyright (C) All rights reserved	JOT AUTOMATION	Size: A3
Scale 1:5 / Mass: kg 69.77 / Metric:mm		Page 2/3
		Item code . Ver: OM017832.0 / Rev.: 2

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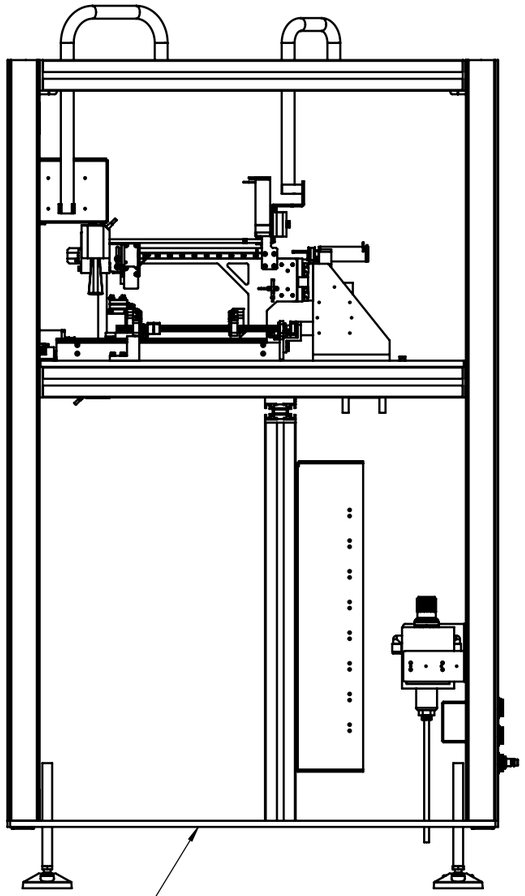

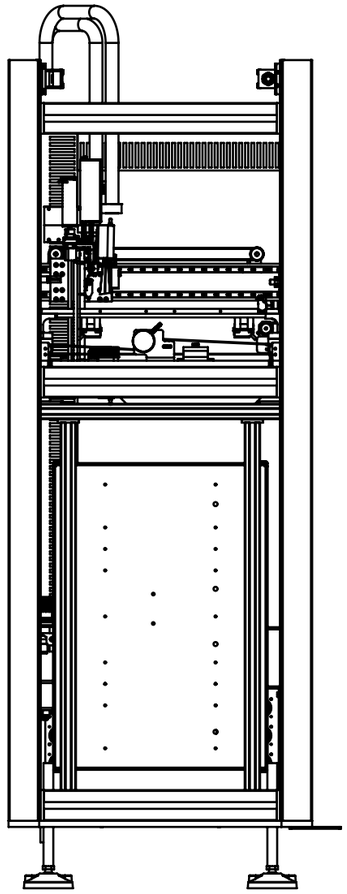

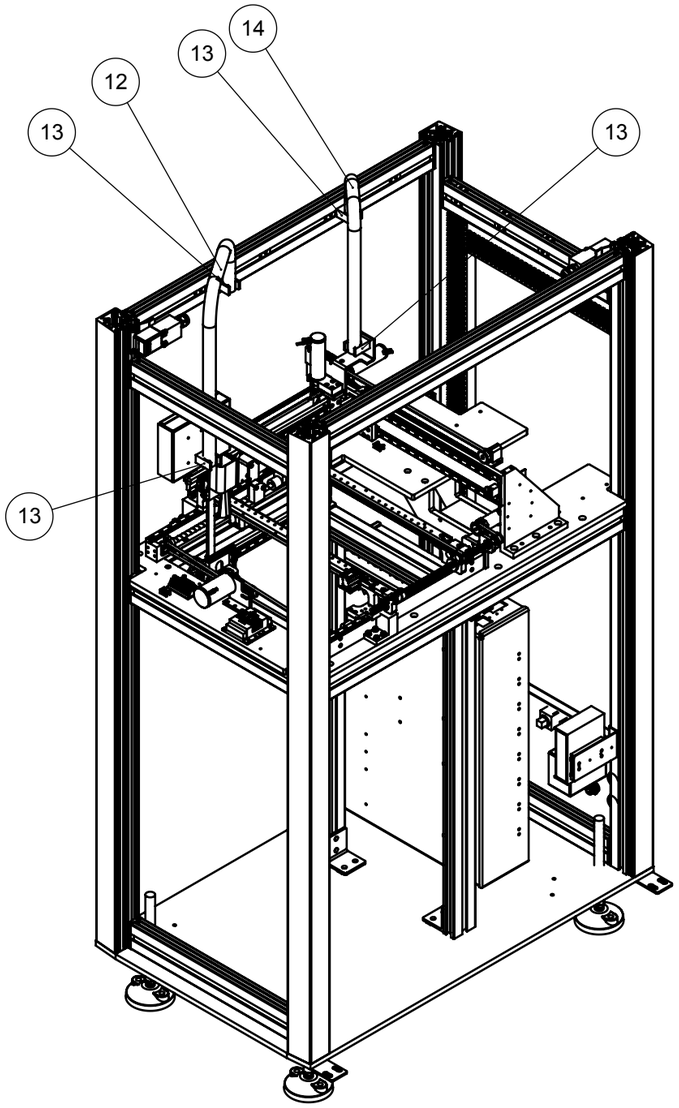

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	Drawn: Iamsjuh 18.11.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	XY axis assembly with conveyor Scanner unit	
Copyright (C) All rights reserved		Size: A3	
Scale 1:10 / Mass: kg 69.77 / Metric:mm		Page 3/3	Item code . Ver: OM017832.0 / Rev. 2

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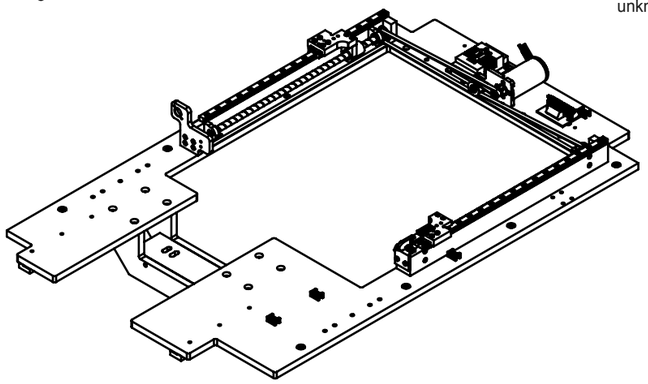
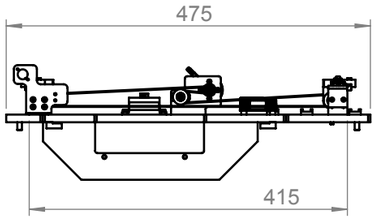
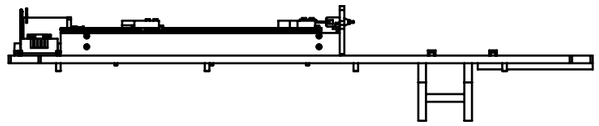
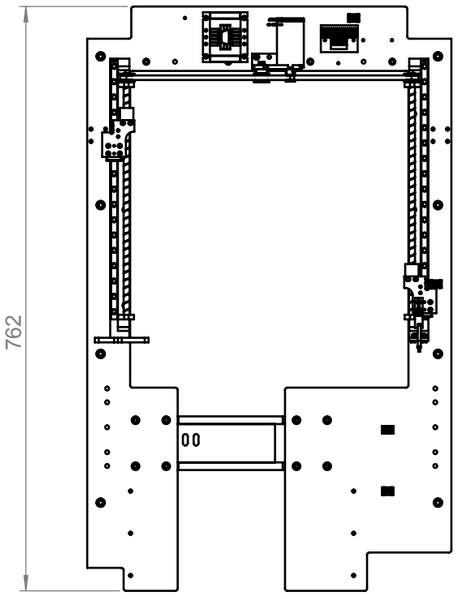
3	Update	unknown1 19.10.2011	









No.	Ref	Code	Ver	Rev	TITLE	TITLE2	QTY	Ft	S
1		OM015956	0	1	Frame plate		1	P	Yes
2		MOT03101	0	0	Brushless DC-Servomotor, 101W, 24V	Faulhaber 3564K024B-K1155	1	P	Yes
3		OM016838	0	0	Belt pulley	16 T2,5 / 12-2	1	P	Yes
4		DRI06664	0	0	Toothed belt	6T2,5/915	1	P	Yes
5		OM015871	0	1	Ball screw and nut		2	P	Yes
6		OM015859	0	3	Nut housing	PLT8-20x30	2	P	Yes
7		OM015585	0	1	Bearing housing		4	P	Yes
8		BEA068	0	2	Single row bearing	686.2Z d=6, D=13, B=5	4		
9		OM015583	0	1	Belt pulley	16-T2,5-20-2	2	P	Yes
10		OM009293	0	0	Linear guide		2	P	Yes
11		OM015956	0	0	Frame plate	Mirrored	1	P	Yes
12		OM015964	0	1	Motor barcket		1	P	Yes
13		OM015966	0	0	Support plate		1	P	Yes
14		M025050	0	1	Assembly of diverting pulley		1	A	Yes
15		OM016674	0	0	Raising bushing		1	P	Yes
16		OM017718	0	2	Base plate assembly	Base assembly Fail marker	1	A	Yes
17		OM017852	0	0	Sensor bracket		1	P	Yes
18		OM019052	0	1	Connector plate		1	P	Yes
19		OM019052	0	1	Connector plate		1	P	
20		MAC01120	0	4	Socket set screws with cup point	M3x3 DIN 916 SS	10	P	Yes
21		MAC01460	0	14	Hex socket head cap screw	M3x10 DIN 912 SM	4		
22		MAC01911	0	2	Socket low head cap screw	M3x10 DIN 7984 SM	50	P	Yes
23		MAC01785	0	21	Hex socket head cap screw	M6x14 DIN 912 SS	8		
24		MAC0572	0	5	Cylindrical pin	4m6x16 DIN 7	4	P	Yes
25		MAC01316	0	1	Hex socket countersunk head screw	M2.5x8 DIN 7991 SS	4	P	Yes
26		MAC01476	0	21	Hex socket head cap screw	M4x10 DIN 912 SS	2		
27		MAC01459	0	21	Hex socket head cap screw	M3x10 DIN 912 SS	8		
28		MAC01631			Hexagon nut	M4 DIN 934 SS	1	P	Yes
29		TMAC0769	0	13	Hex socket countersunk head screw	M4x25 DIN 7991 SS	1	P	Yes
30		MAC10028	0	19	Flat washer without chamfer	M4 DIN 125 SS	1		
31		MAC01925	0	2	Socket low head cap screw	M4x16 DIN 7984 SM	6	P	Yes
32		OM019337	0	0	Identification plate		1	P	Yes

Revision note:

Standard:

Designed: unknown1

Drawn: lamsjuh 20.10.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT automation

Base assembly Fail marker

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:8	0		1/3	OM017716.0	3

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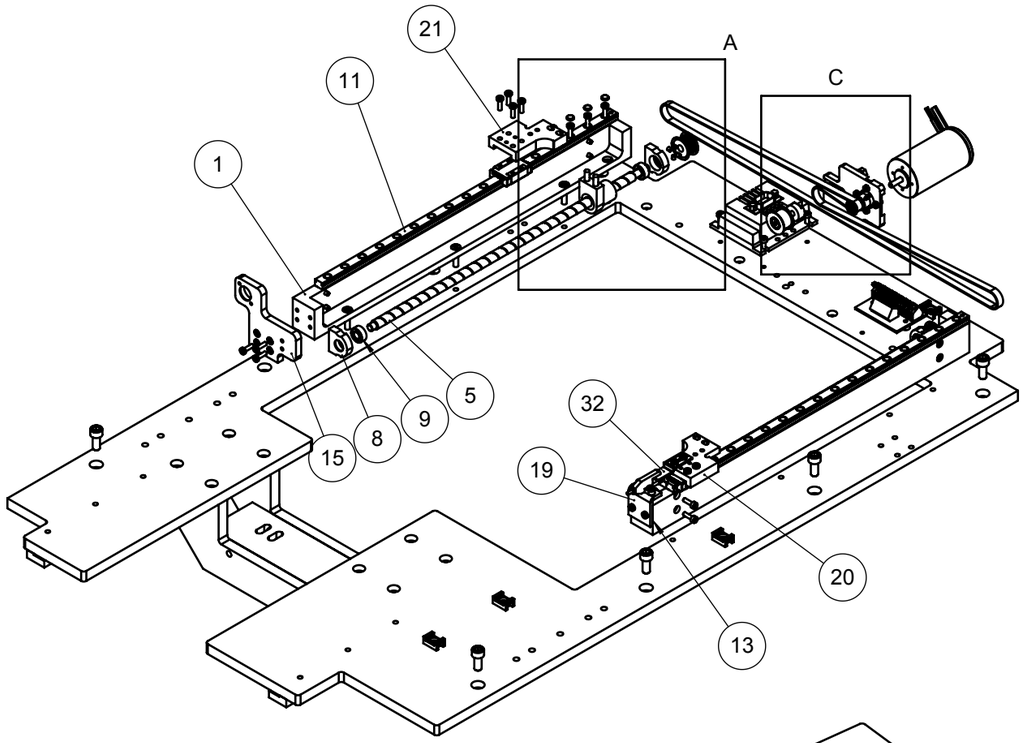
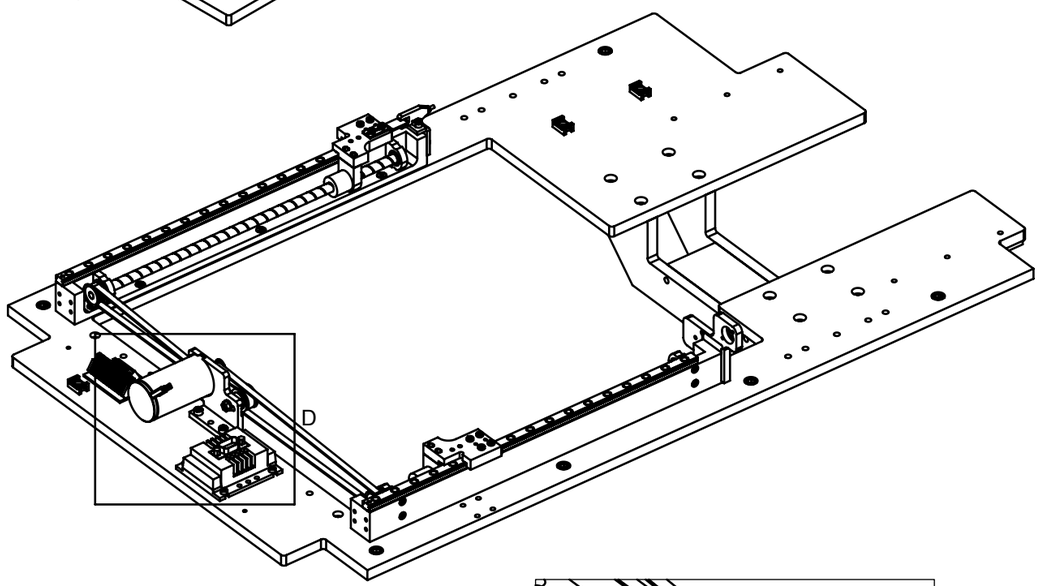
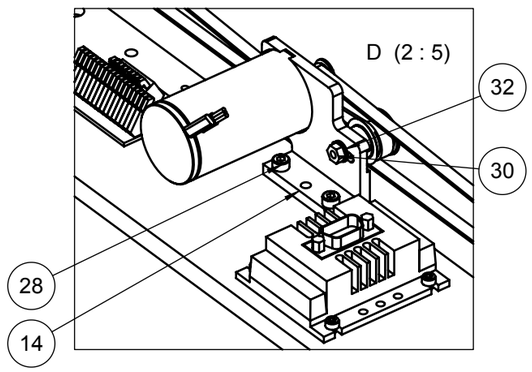
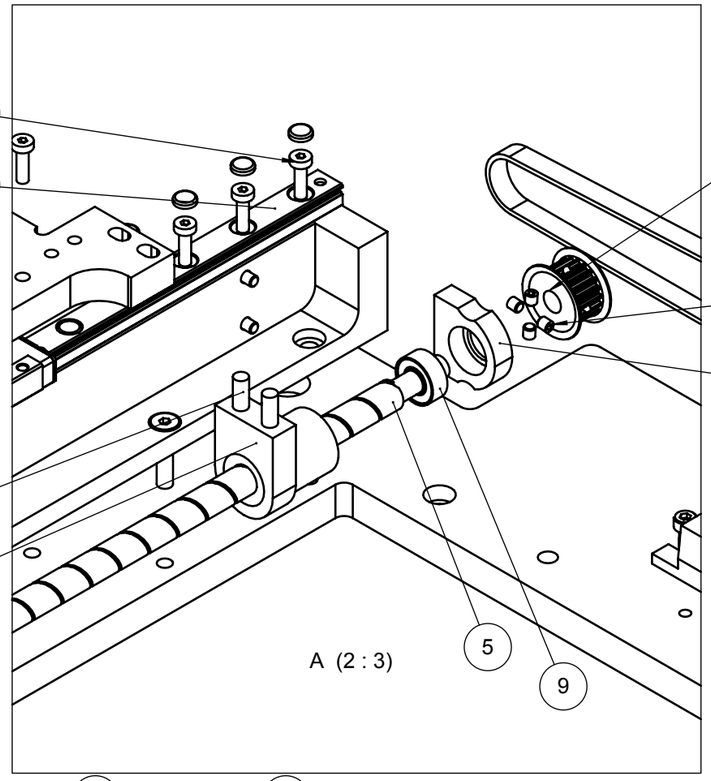
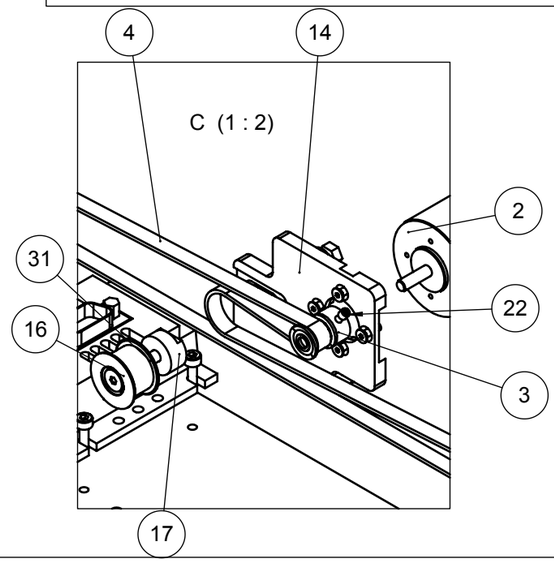
Rev:	Revision note:	Designed	Drawn
1	m	unknown1 30.06.2011	
2	brackets changed	unknown1 30.06.2011	
3	Update	unknown1 19.10.2011	





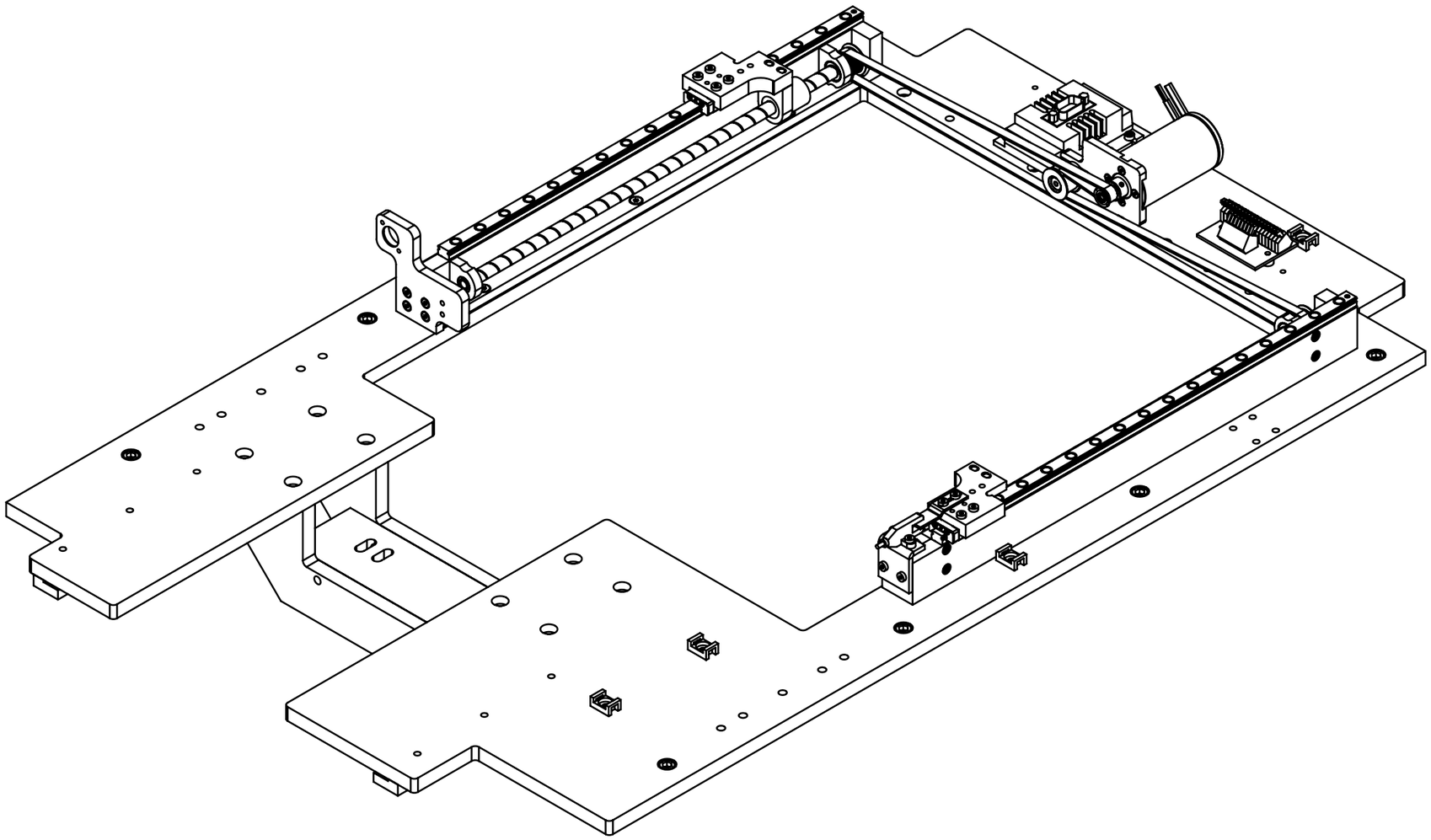






Revision note:			
Standard:	Designed: unknown1	Material: Unspecified	
	Drawn: lamsjuh 20.10.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	Base assembly Fail marker	
Copyright (C) All rights reserved		Size: A3	
Scale 1:5 / Mass: kg 0 / Metric:mm		Page 2/3	Item code . Ver: OM017716.0 / Rev. 3

Rev:	Revision note:	Designed	Drawn
1	m	unknown1 30.06.2011	
2	brackets changed	unknown1 30.06.2011	
3	Update	unknown1 19.10.2011	



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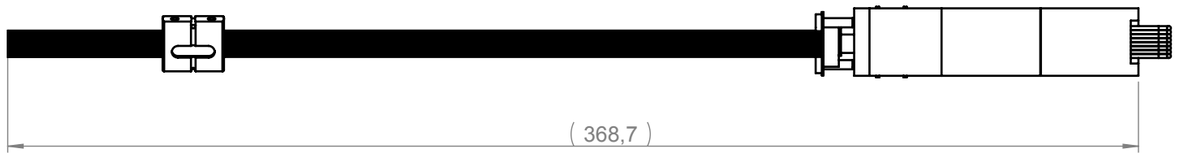
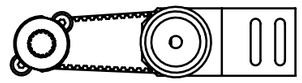
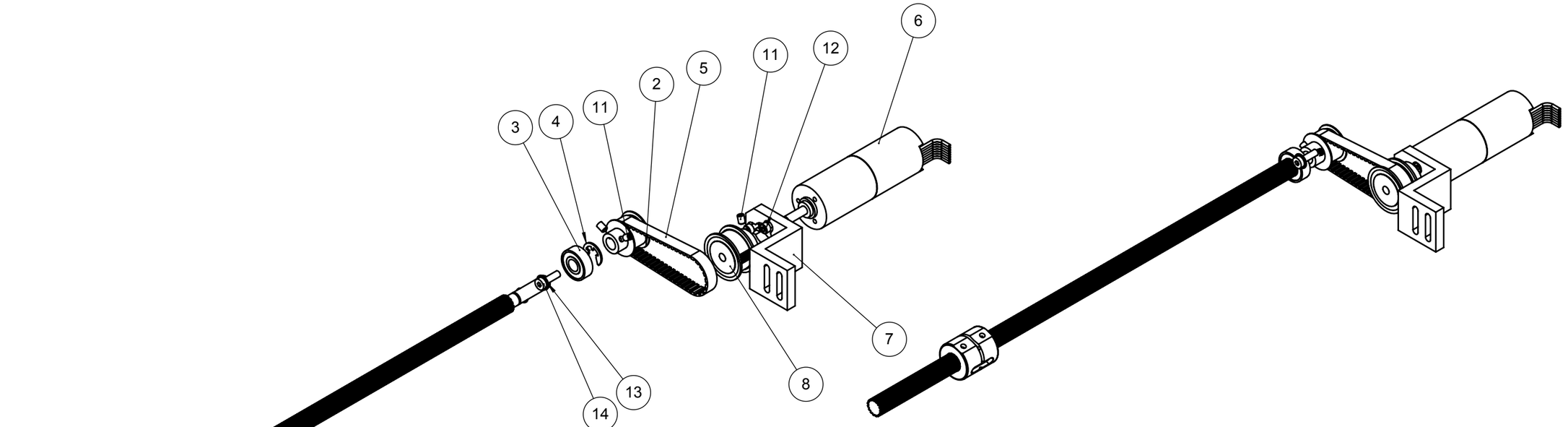
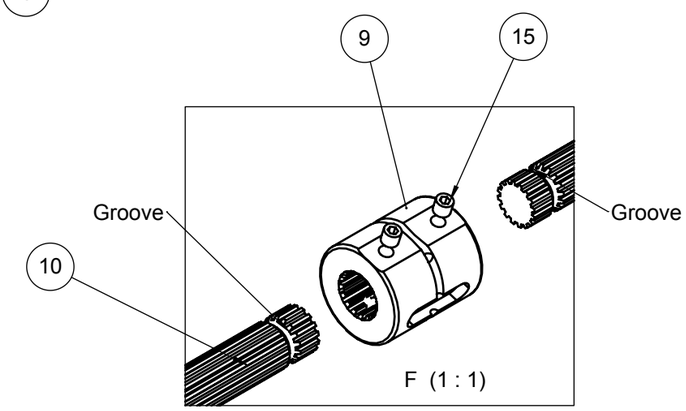
Revision note:			
Standard:	Designed: unknown1	Material: Unspecified	
	Drawn: lamsjuh 20.10.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	Base assembly Fail marker	
Copyright (C) All rights reserved		Size: A3	
Scale 1:3 / Mass: kg 0 / Metric:mm		Page 3/3	Item code . Ver: OM017716.0 / Rev.: 3

Rev:	Revision note:	Designed	Drawn
1	Screws changed	unknown1 01.11.2011	









No.	Code	Ver	TITLE	TITLE2	QTY	Ft
15	TMAC0113	0	socket set screw	M 3x 4 DIN914	4	P
14	MAC01911	0	Socket low head cap screw	M3x10 DIN 7984 SM	2	P
13	MAC10026	0	Flat washer without chamfer	M3 DIN 125 SS	2	
12	MAC01443	0	Hex socket head cap screw	M2.5x6 DIN 912 SM	3	P
11	MAC01658	0	Locking screw	M3x4 DIN 913 SS	4	P
10	OM019349	0	Axle machining	MISUMI TSPR8-60	1	P
9	OM018594	0	Machining of sleeve	Misumi TSPB8	1	P
8	EM049166	0	Machining drawing	2200002175/SYNCHROFLEX AL16T2.5/25-2	1	P
7	OM015869	0	Motor barcket		1	P
6	MOT0279	0	DC-Brushless Gearmotor, 12W, 24V, G	MAXON EC-Max 22 + GP 22C	1	P
5	DRI06495	0	Timing belt	T2,5-6_145	1	P
4	TMAC0230	0	Lock washer	5 DIN 6799 SS	1	
3	BEA06195	0	Sealed single row deep groove bearing	SKF 619/6-2Z	1	P
2	EM048246	0	Timing Pulley	DRI05101 (Synchroflex Al 16T2.5/19-2)	1	P
1	OM019350	0	Axle machining	MISUMI TSPRW8-300-F25-V6-S0-Q6	1	P

Revision note: Created

Standard:	Designed: unknown1 22.10.2011	Material: Unspecified
	Drawn: lamsjuh 01.11.2011	Finish: Unspecified

RoHS:

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JOT AUTOMATION

Transmission assembly

Scale	Mass: kg	Metric:mm	Size: A3	
1:2	0		Page 1/1	Item code . Ver: OM019348.0

Rev. 1

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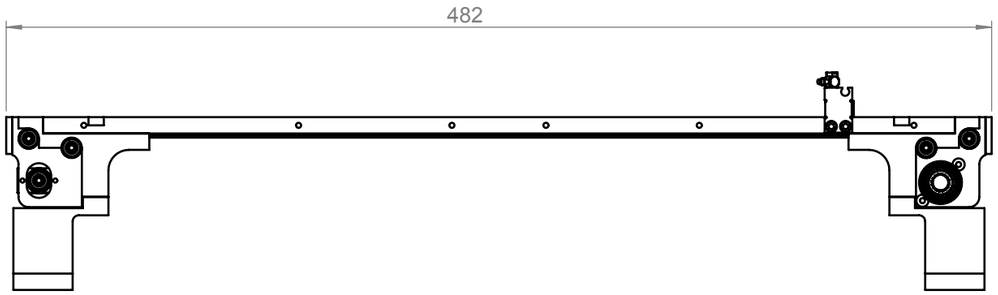
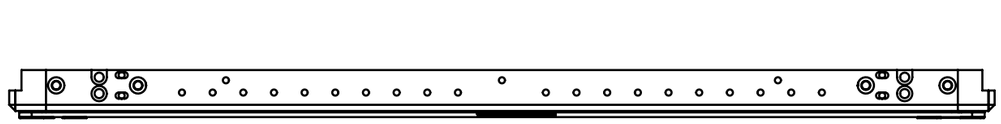
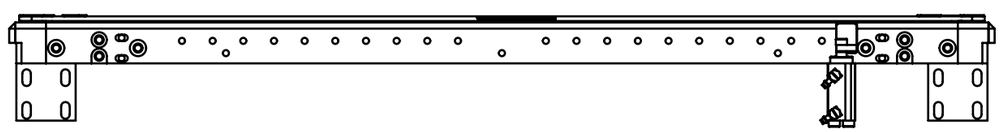
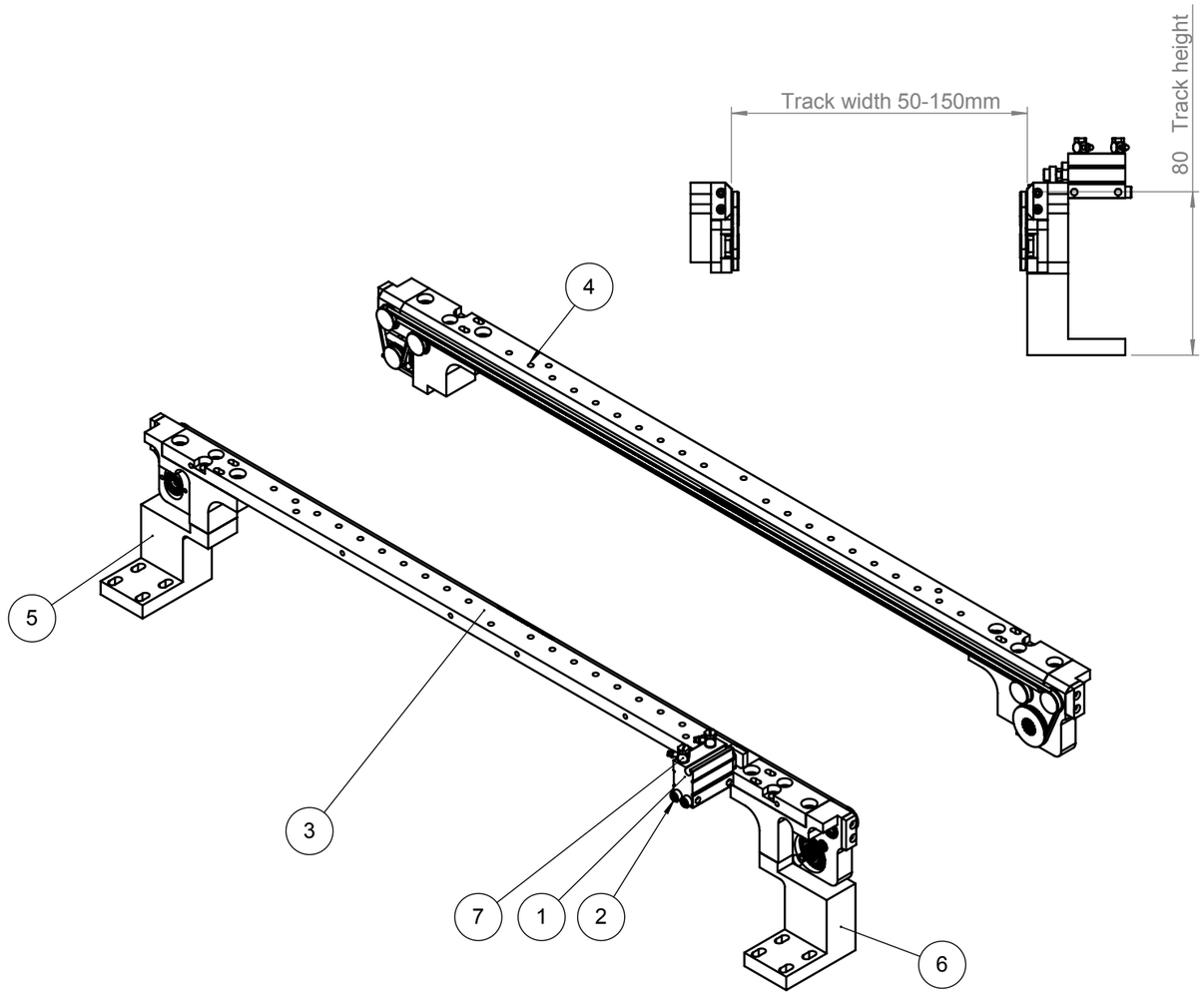
Rev:	Revision note:	Designed	Drawn
1	conveyors changed	unknown1 30.06.2011	
2	Update	unknown1 22.10.2011	









No.	Ref	Code	Ver	Rev	TITLE	TITLE2	QTY	Ft	S
1		OM019067	0	1	Stopper cylinder assy		1	A	Yes
2		MAC01762	0		Hex socket head cap screw	M3x35 DIN 912 SS	2		
3		OM019072	0	0	Conveyor block, fixed edge		1	A	
4		OM019036	0	0	Conveyor block, Moving edge		1	A	
5		OM019065	0	0	conveyor bracket		1	P	Yes
6		OM019065	0	0	conveyor bracket	mirrored	1	P	
7		2200025655	0	2	Miniature fitting, barb elbow for soft tube	SMC M-3ALU-4	2		

Revision note:

Standard:

Designed: unknown1

Drawn: lamsjuh 22.10.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT automation

Conveyor assembly
Conveyor Fail marker

Size: A3

Scale	Mass: kg	Metric:mm	Page
1:3	0.13		1/1

Item code . Ver: OM017749.0

Rev.: 2

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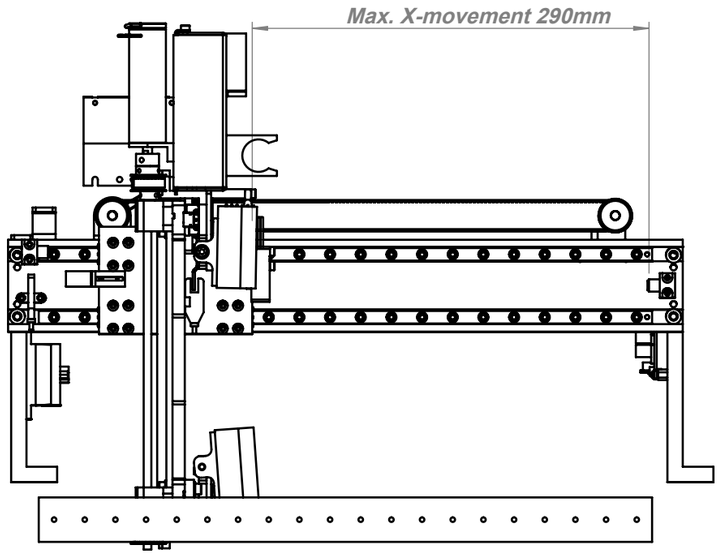
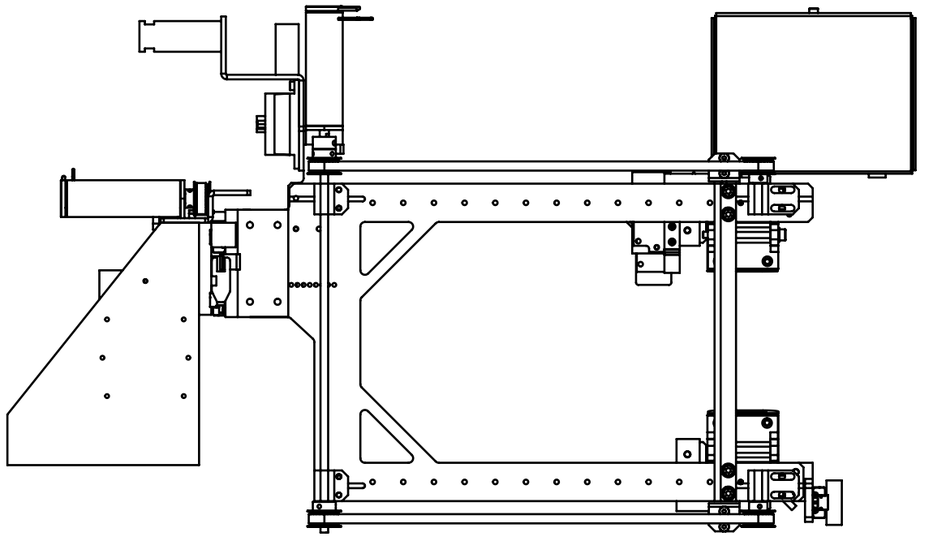
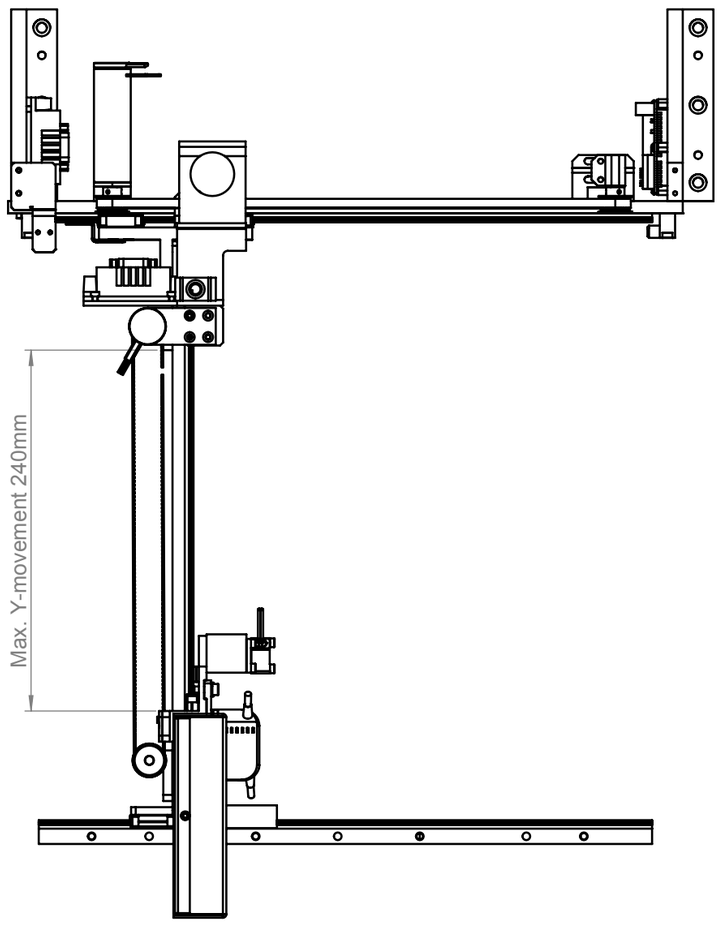
Rev:	Revision note:	Designed	Drawn
1	update	unknown1 19.10.2011	
2	Update	unknown1 22.10.2011	







NO.	DWGNO	VER	REV	TITLE	TITLE2	QTY	FTYPE
1	OM017830	0	6	Y-Axis assembly	Scanner unit	1	A
2	OM017753	0	1	Front side support flange	Fail marker assy	1	P
3	OM009293	0	0	Linear guide		1	P
4	OM009293	0	0	Linear guide		2	P
5	OM017764	0	4	x-movement mechanics	fail marker assy	1	A
6	MAC01472	0	14	Hex socket head cap screw	M3x6 DIN 912 SM	8	
7	MAC01911	0	2	Socket low head cap screw	M3x10 DIN 7984 SM	20	P

Revision note: Created

Standard:

Designed: unknown1

Drawn: lamsjuh 22.10.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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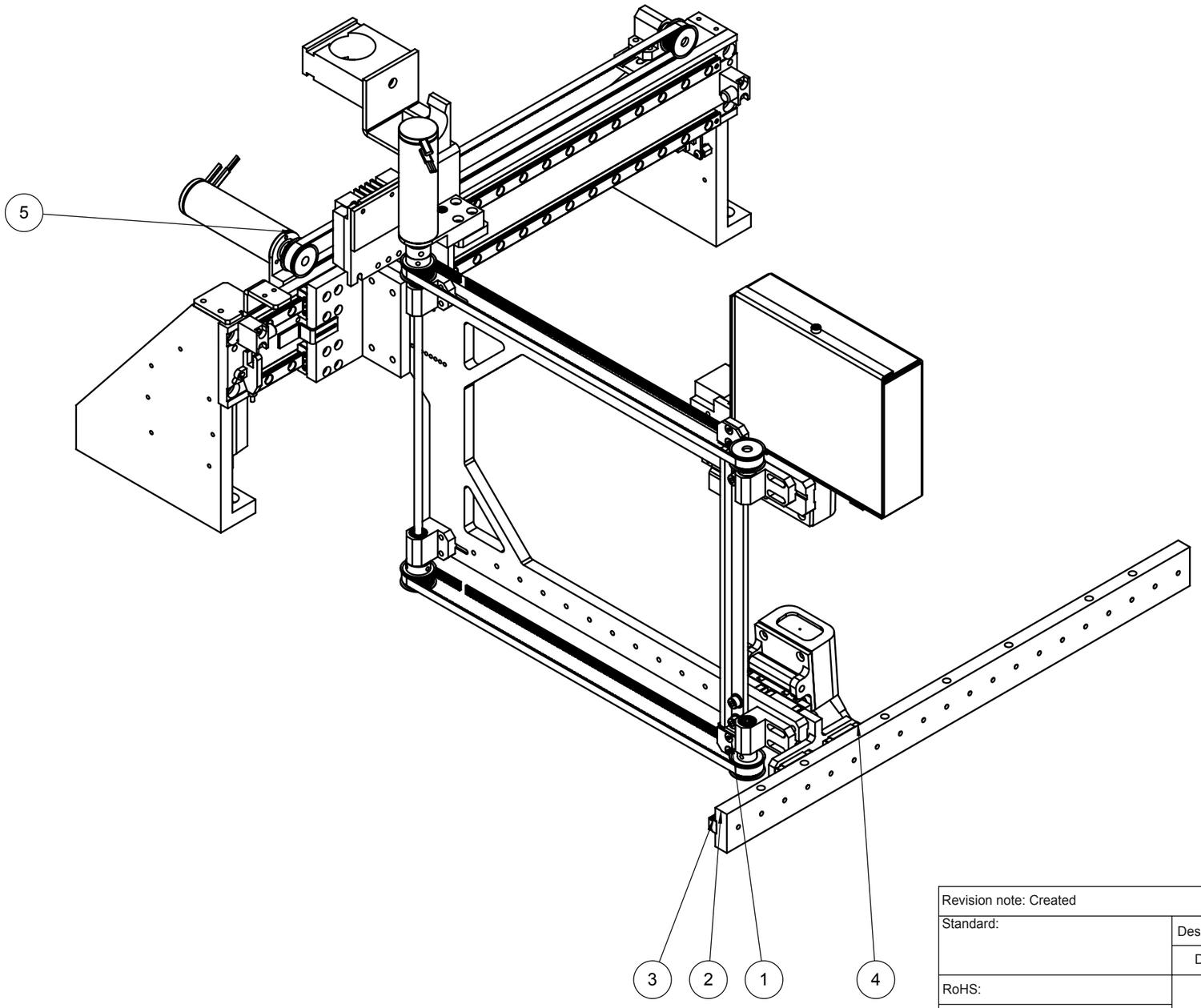
JOT automation

XY-axis assembly
Scanner unit

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:4	23.15		1/3	OM017831.0	2

Rev:	Revision note:	Designed	Drawn
1	update	unknown1 19.10.2011	
2	Update	unknown1 22.10.2011	



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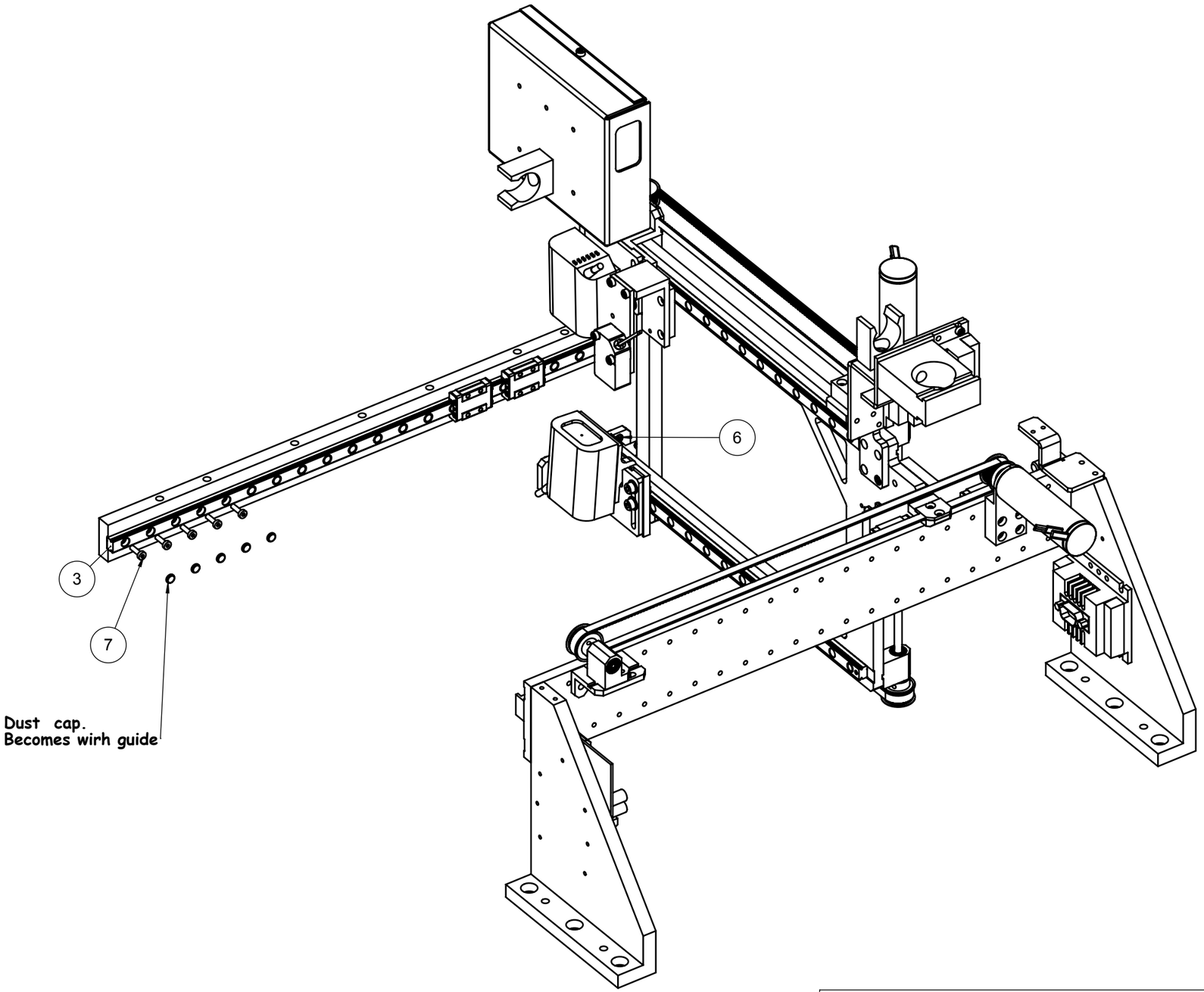
Revision note: Created			
Standard:	Designed: unknown1		Material: Unspecified
	Drawn: lamsjuh 22.10.2011		Finish: Unspecified
RoHS:	JOT AUTOMATION	XY-axis assembly Scanner unit	
Copyright (C) All rights reserved		Size: A3	
Scale 1:3 / Mass: kg 23.15 / Metric:mm		Page 2/3	Item code . Ver: OM017831.0 / Rev. 2

Rev:	Revision note:	Designed	Drawn
1	update	unknown1 19.10.2011	
2	Update	unknown1 22.10.2011	



Revision note: Created				
Standard:		Designed: unknown1		Material: Unspecified
		Drawn: lamsjuh 22.10.2011		Finish: Unspecified
RoHS:		JOT AUTOMATION	XY-axis assembly Scanner unit	
Copyright (C) All rights reserved			Size: A3	
Scale 1:3	Mass: kg 23.15	Metric:mm	Page 3/3	Item code . Ver: OM017831.0 / Rev.: 2

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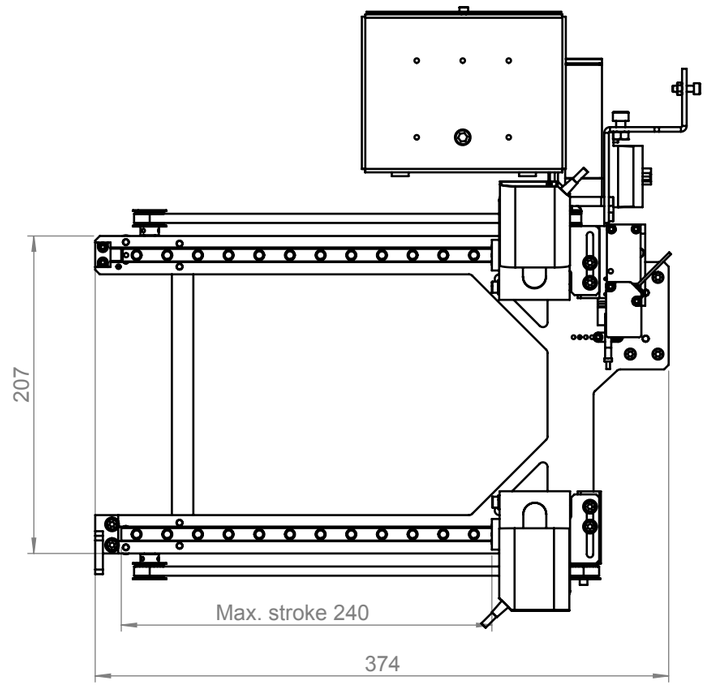
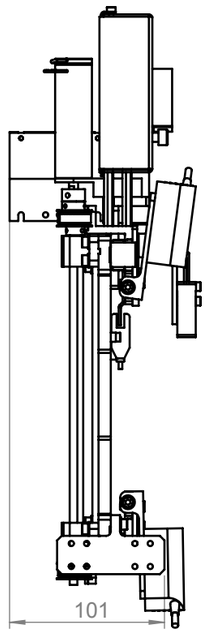
Rev:	Revision note:	Designed	Drawn
7	Fastening plates of Reader changed	unknown1 28.10.2011	
8	Hose clamps removed	unknown1 18.11.2011	
9	Added stopper	unknown1 30.11.2011	





No.	Ref	Code	Ver	TITLE	TITLE2	QTY	Ft	S
1		OM017767	0	Y-movement frame plate	Fail marker Y-mechanics	1	P	Yes
2		OM009293	0	Linear guide		2	P	Yes
3		OM017778	0	Fastening bracket for reader	Fail marker y-mechanics	1	P	Yes
4		OM017792	0	Y movement assembly	Fail marker	1	A	Yes
5		OM017765	0	Support bar	Fail marker Y-mechanics	1	P	Yes
6		OM017766	0	Mounting flange	Fail marker Y-mechanics	1	P	Yes
7		OM019281	0	Connection plate for belt		2	P	Yes
8		OM017794	0	Motor bracket	Y movement fail marker	1	P	Yes
9		OM017773	0	z-adjustment flange	Fail marker y-mechanics	1	P	Yes
10		OM017769	0	Fastening flange for reader	Fail marker Y-mechanics	1	P	Yes
11		OM017779	0	Reader bracket bottom side	Fail marker y-mechanics	1	P	Yes
12		OM017773	0	z-adjustment flange	Mirrored	1	P	Yes
13		OM017768	0	Bracket for energy chain	Fail marker Y-mechanics	1	P	Yes
14		OM017761	0	Plate	Fail marker assy	1	P	Yes
15		OM018356	0	Box assembly		1	A	Yes
16		OM018249	0	Sensor assembly		1	A	Yes
17		OM018281	0	Cylinder bracket		1	P	Yes
18				Allen Screw	M 3x 6 DIN912	2		
19		MAC01556	0	Hex socket countersunk head screw	M3x10 DIN 7991 SS	2	P	Yes
20		MAC01524	0	Hex socket head cap screw	M6x12 DIN 912 SM	2		
21		MAC01635	0	Hexagon nut	M6 DIN 934 Zn	2		
22		MAC01480	0	Hex socket head cap screw	M4x14 DIN 912 SM	1		
23		MAC01631	0	Hexagon nut	M4 DIN 934 Zn	1		
24		MAC01472	0	Hex socket head cap screw	M3x6 DIN 912 SM	18		
25		TMAC0135	0	Hex socket head cap screw	M4x16 DIN 912 SM	4		
26		MAC01475	0	Hex socket head cap screw	M3x8 DIN 912 SM	3		
27		MAC0572	0	Cylindrical pin	4m6x16 DIN 7	2	P	Yes
28		MAC01564	0	Hex socket countersunk head screw	M3x6 DIN 7991 SS	6	P	Yes
29		MAC01552	0	Hex socket countersunk head screw	M2x5 DIN 7991 SS	2	P	Yes
30		MAC01461	0	Hex socket head cap screw	M3x12 DIN 912 SM	8		
31		MAC01770	0	Hex socket head cap screw	M4x50 DIN 912 SM	2		
32		MAC01479		Allen Screw	M 4x 12 DIN912	12		
33		MAC10028	0	Plate washer	ALE 4,3A DIN125	16		
34		MAC10026	0	Plate washer	ALE 3,2A DIN125	4		
35		MAC01460	0	Hex socket head cap screw	M3x10 DIN 912 SM	4		
36		MAC01911	0	Socket low head cap screw	M3x10 DIN 7984 SM	30	P	Yes
37		MAC01478	0	Hex socket head cap screw	M4x12 DIN 912 SM	2		
38		OM019370	0	Fastening plate for reader	.	1	P	Yes
39		1100000772	0	Distance bolt L=35	M3-SW5.5 5.13.351	2	P	Yes
40		OM019347	0	Bracket		1	P	Yes
41		MAC0616	0	Vibration absorbers	D=8, H=8, M3x6	1	P	Yes
42		MAC01465	0	Hex socket head cap screw	M3x20 DIN 912 SM	2		

9

Revision note:

Standard:

Designed: vesapaa 28.01.2011

Drawn: lamsjuh 30.11.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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Y-Axis assembly
Scanner unit

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:4	0		1/4	OM017830.0	9

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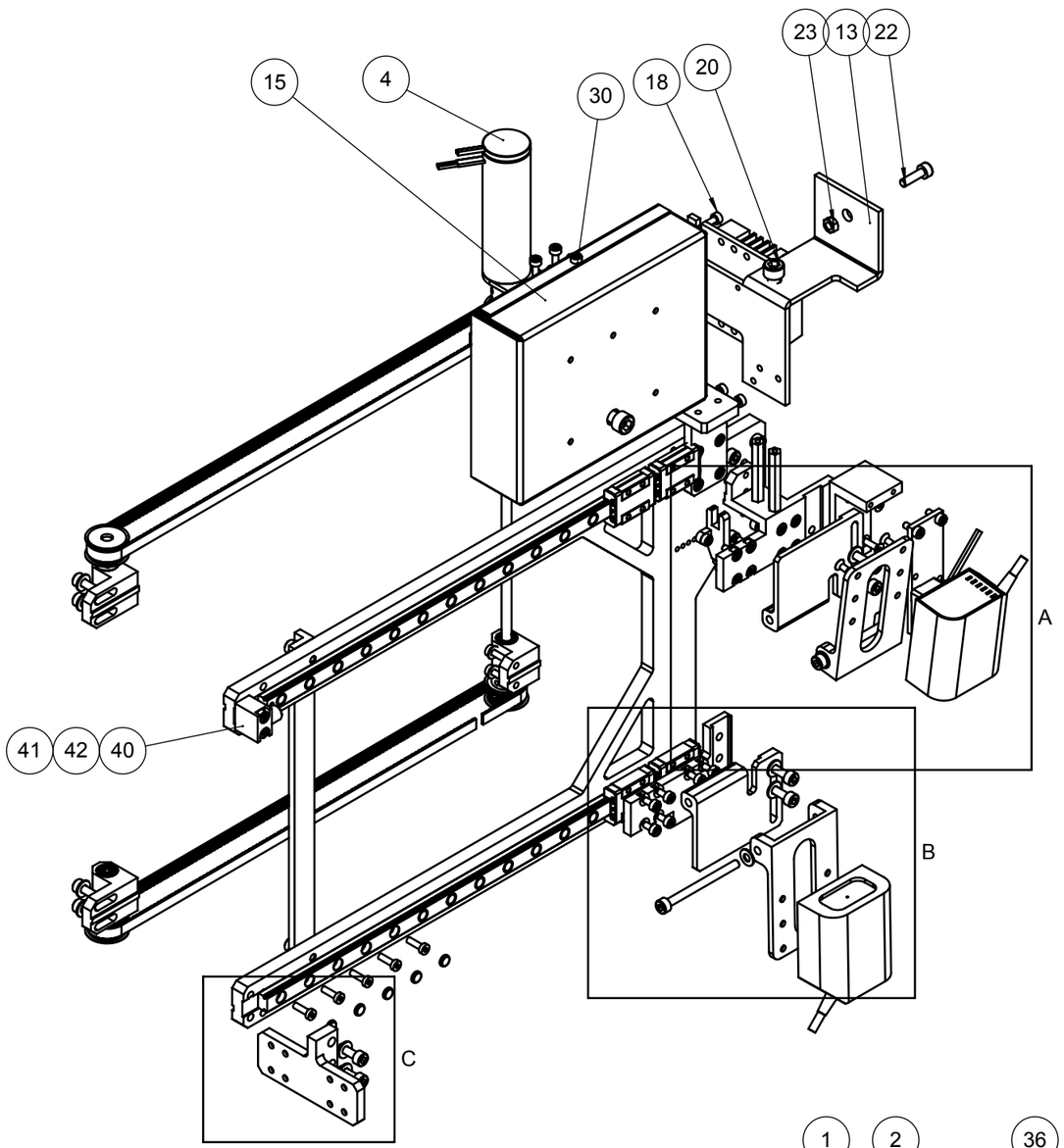
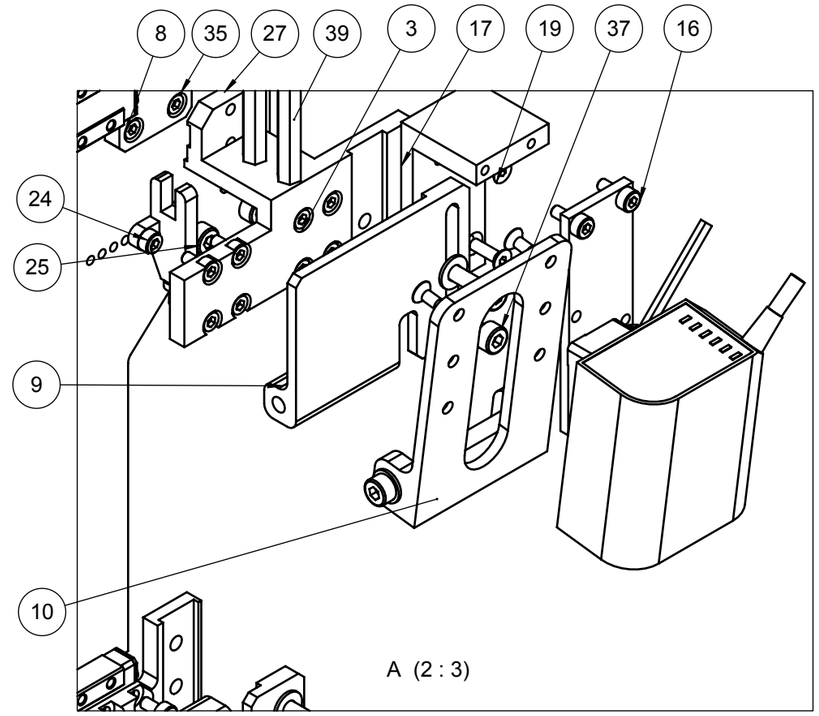
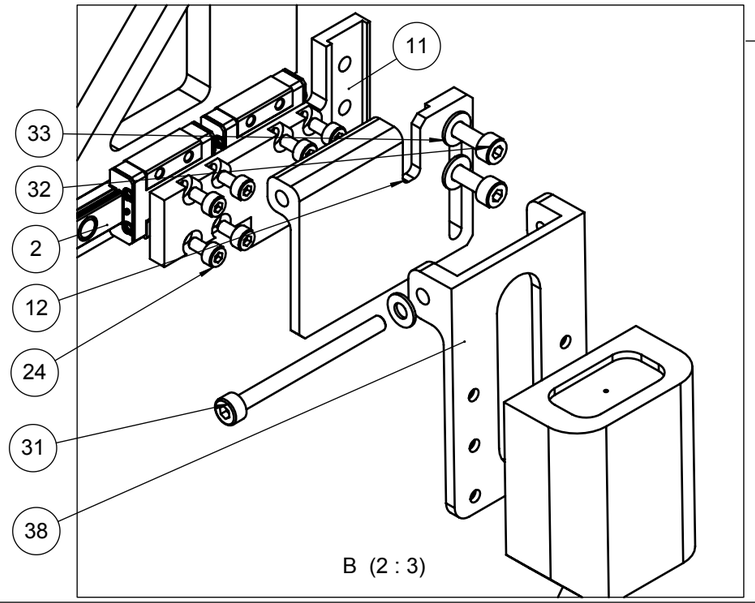
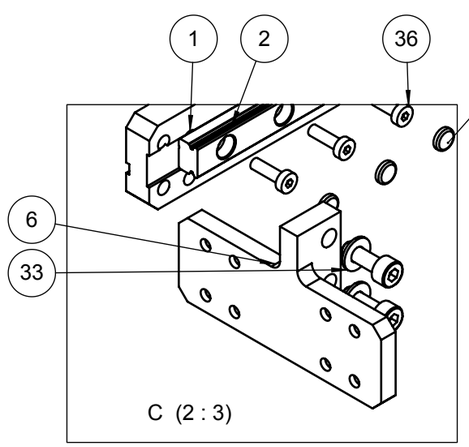
Rev:	Revision note:	Designed	Drawn
7	Fastening plates of Reader changed	unknown1 28.10.2011	
8	Hose clamps removed	unknown1 18.11.2011	
9	Added stopper	unknown1 30.11.2011	





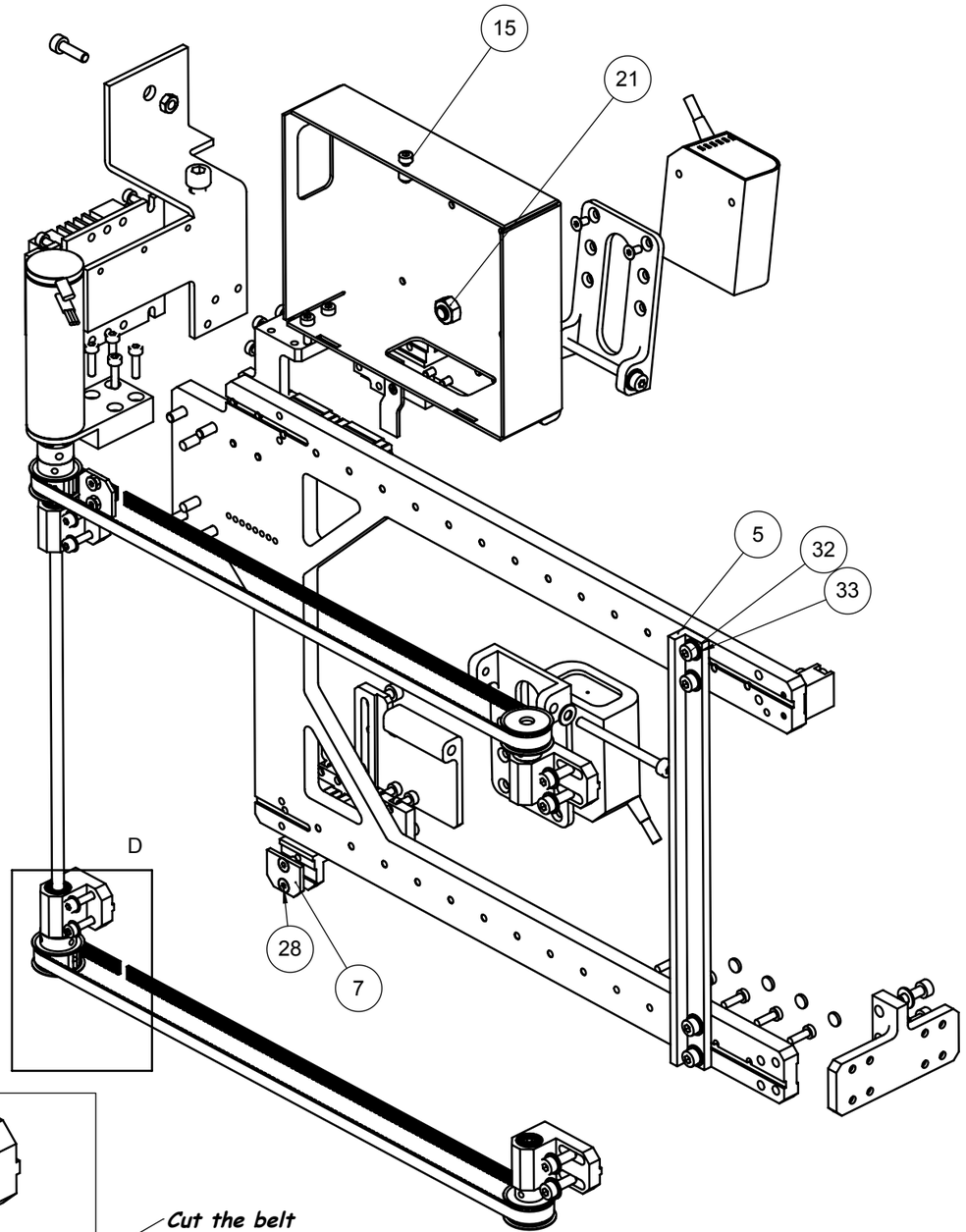


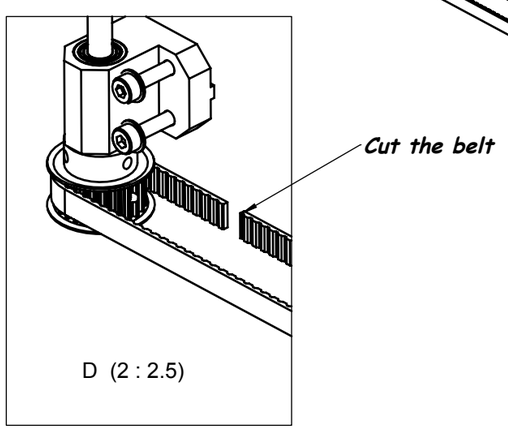


Dust cap.
Becomes with guide

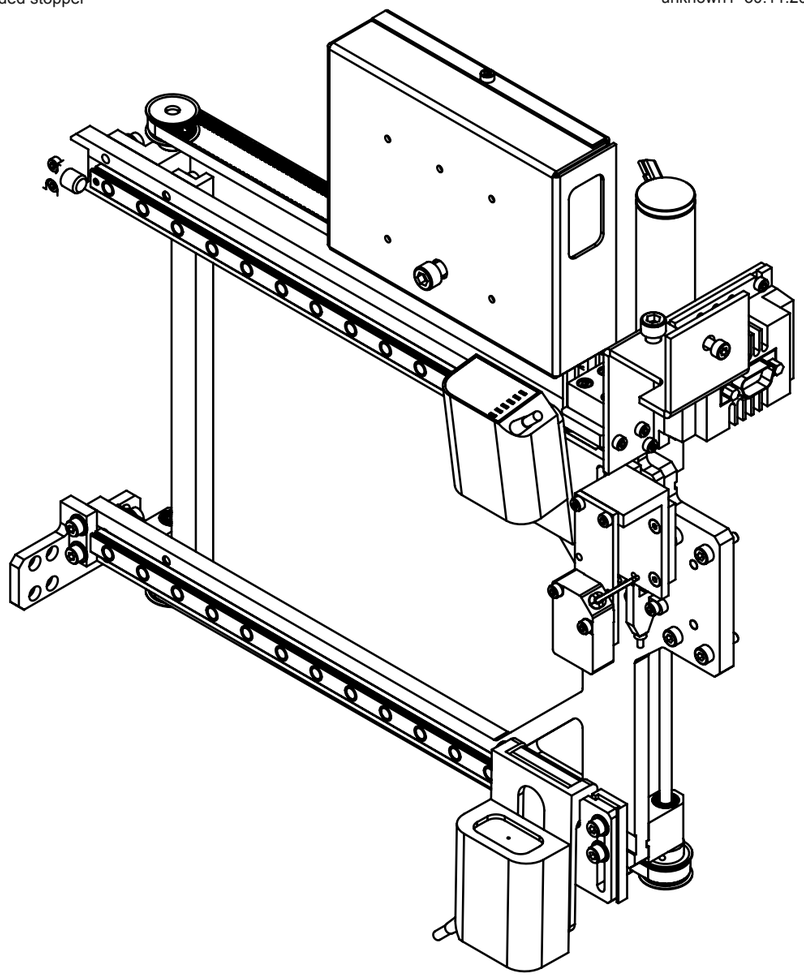
Revision note:			
Standard:	Designed: vesapaa 28.01.2011	Material: Unspecified	
	Drawn: lamsjuh 30.11.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	Y-Axis assembly Scanner unit	
Copyright (C) All rights reserved		Size: A3	
Scale 1:3 / Mass: kg 0 / Metric:mm		Page 2/4	Item code . Ver: OM017830.0 / Rev. 9

Rev:	Revision note:	Designed	Drawn
7	Fastening plates of Reader changed	unknown1 28.10.2011	
8	Hose clamps removed	unknown1 18.11.2011	
9	Added stopper	unknown1 30.11.2011	





D (2 : 2.5)



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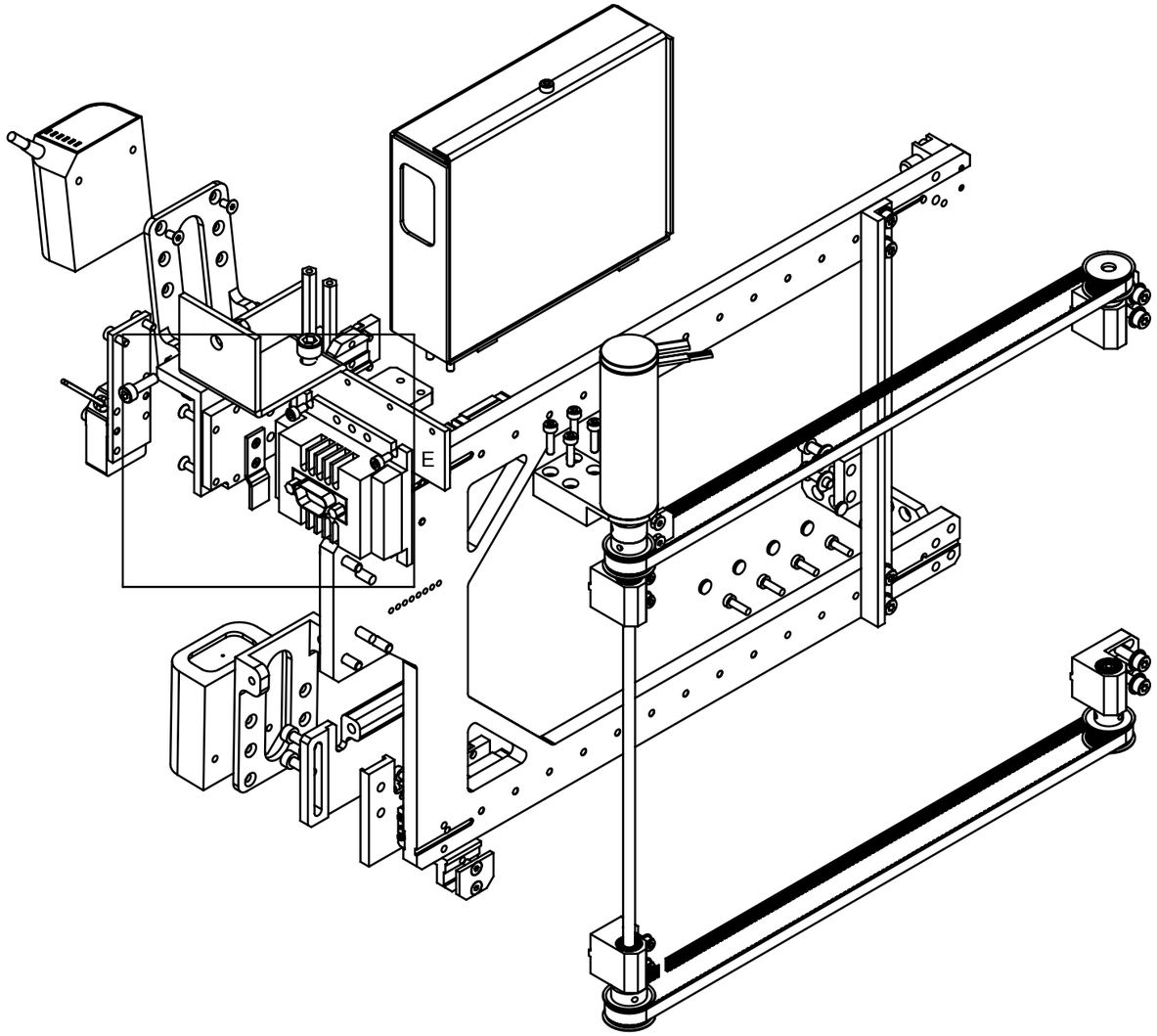
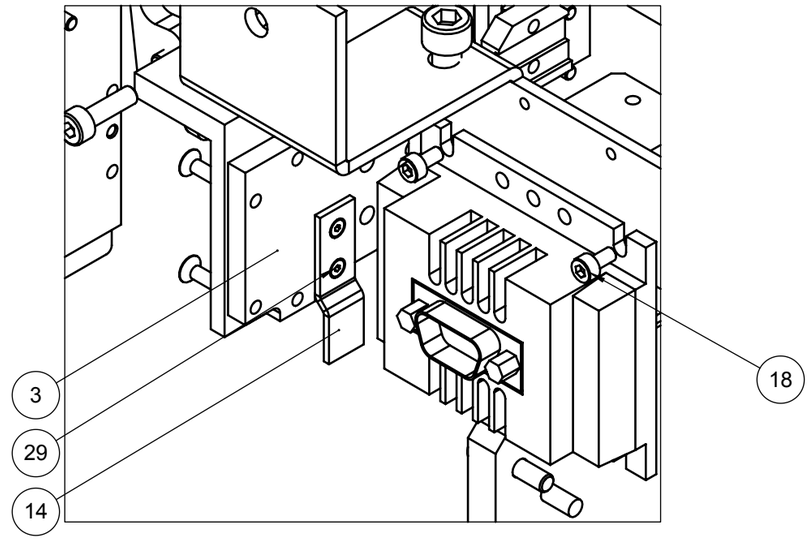
Revision note:			
Standard:	Designed: vesapaa 28.01.2011	Material: Unspecified	
	Drawn: lamsjuh 30.11.2011	Finish: Unspecified	
RoHS:		Y-Axis assembly Scanner unit	
Copyright (C) All rights reserved	JOT automation	Size: A3	
Scale 1:2.5 / Mass: kg 0 / Metric:mm		Page 3/4	Item code . Ver OM017830.0 / Rev. 9

Rev:	Revision note:	Designed	Drawn
7	Fastening plates of Reader changed	unknown1 28.10.2011	
8	Hose clamps removed	unknown1 18.11.2011	
9	Added stopper	unknown1 30.11.2011	





E (2 : 2.5)

Revision note:			
Standard:	Designed: vesapaa 28.01.2011	Material: Unspecified	
	Drawn: lamsjuh 30.11.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	Y-Axis assembly Scanner unit	
Copyright (C) All rights reserved		Size: A3	
Scale 1:2.5 / Mass: kg 0 / Metric:mm		Page 4/4	Item code . Ver OM017830.0 / Rev. 9

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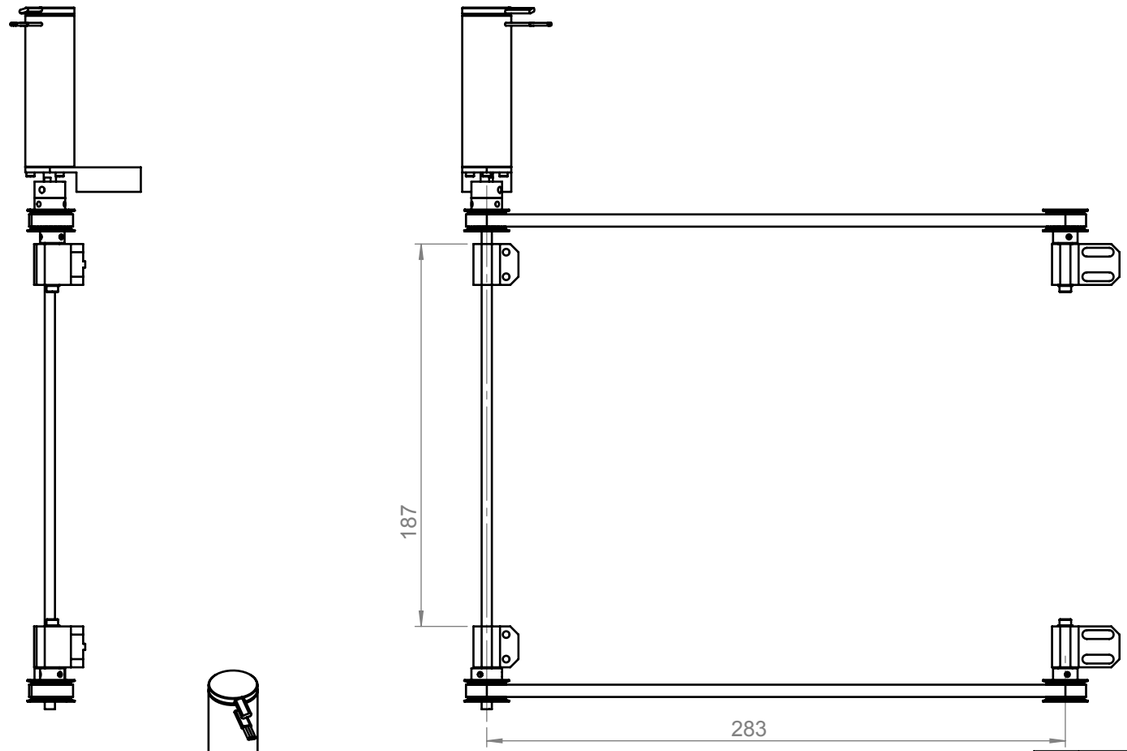
Rev:	Revision note:	Designed	Drawn
3	belts changed	unknown1 22.09.2011	
4	update	unknown1 19.10.2011	
5	Update	unknown1 22.10.2011	



NO.	DWGNO	VER	REV	TITLE	TITLE2	Default/QTY	FTYPE
1	MOT03100	0	0	Brushless DC-Servomotor, 36W, 24V, gear 14:1	Faulhaber 2444 S024B-K1155 + 23/1 14:1	1	P
2	OM019320	0	0	Turning wheel axle	bearing 5mm wheel 6mm	2	P
3	BEA0215	1	3	Deep groove ball bearing, single row	685ZZ, d=5mm, D=11mm, B1=5mm	8	P
4	DRI06656	0	0	Tooth belt	T2,5 -Widht-Length Moulded	2	P
5	OM019132	0	0	bearing housing		2	P
6	OM019138	0	0	motor bracket	x-movement mechanics	1	P
7	OM017784	0	0	Connection bar	Y-mechanics fail marker	1	P
8	OM019134	0	0	Belt pulley	16 T2,5/24-2	1	P
9	OM019131	0	0	bearing housing		2	P
10	OM017791	0	2	Pulley assembly	y-mechanics fail marker	1	A
11	OM017520	0	0	Belt pulley	16 T2,5 / 24-2	2	P
12	MAC01656	0	10	Locking screw	M3x3 DIN 913 SS	9	P
13	MAC01472	0	2	Hex socket head cap screw	M3x6 DIN 912 SM	2	P
14	MAC01454	0	2	Hex socket head cap screw	M2x5 DIN 912 SM	3	P
15	MAC10026	0	0	Plate washer	ALE 3,2A DIN125	2	

Revision note:

Standard:

Designed: unknown1

Drawn: lamsjuh 22.10.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT AUTOMATION

Y movement assembly
Fail marker

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:3	0		1/2	OM017792.0	5

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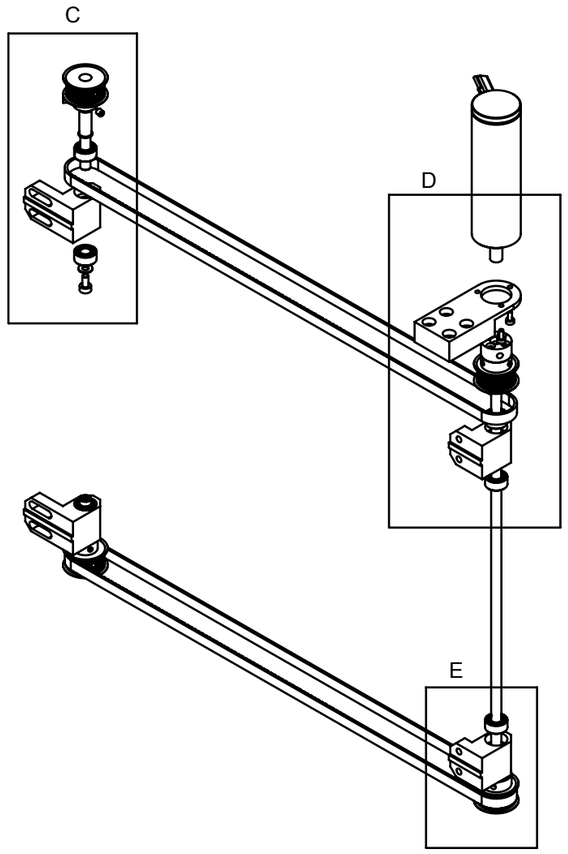
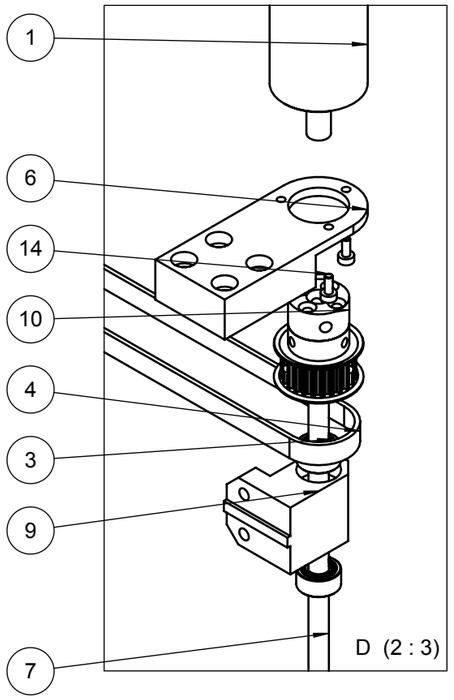
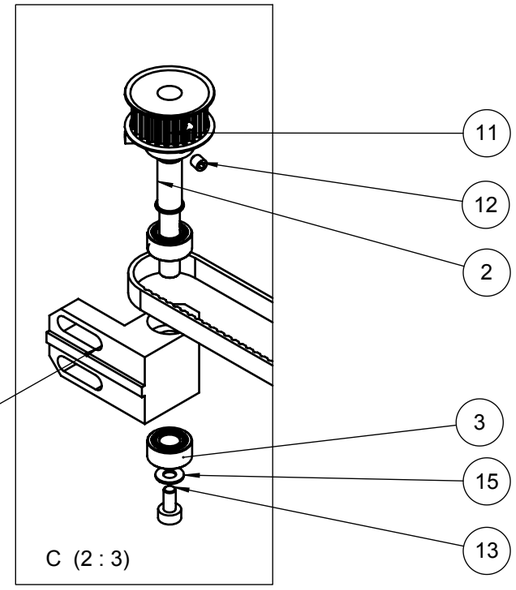
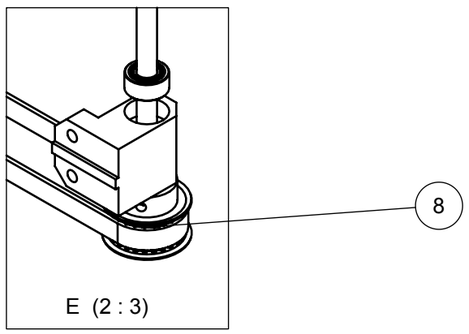
Rev:	Revision note:	Designed	Drawn
3	belts changed	unknown1 22.09.2011	
4	update	unknown1 19.10.2011	
5	Update	unknown1 22.10.2011	



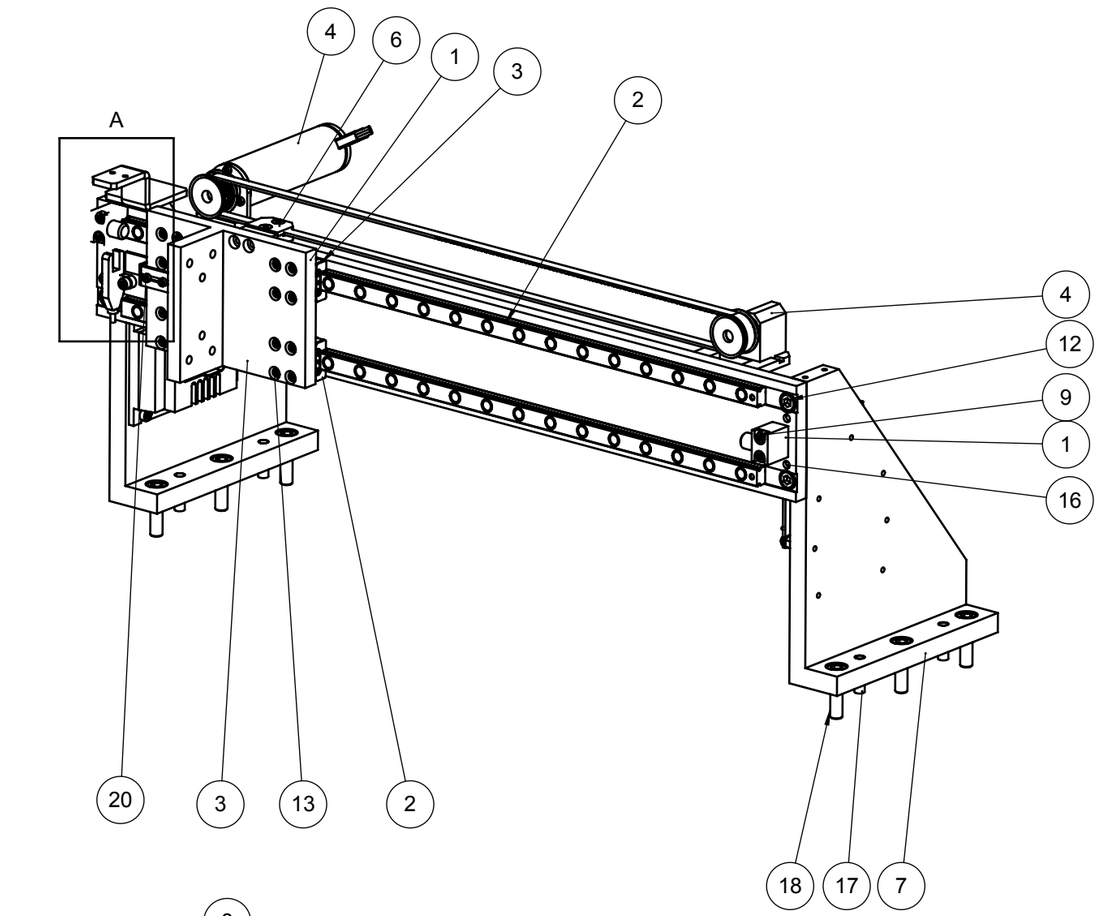


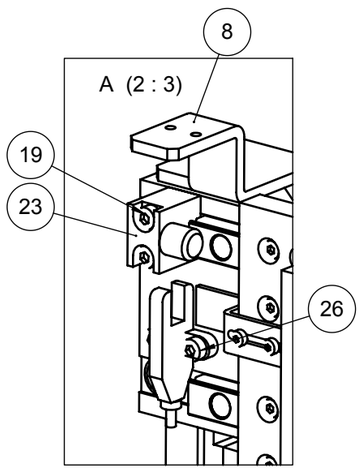




Revision note:				
Standard:		Designed: unknown1	Material: Unspecified	
		Drawn: lamsjuh 22.10.2011	Finish: Unspecified	
RoHS:		JOT AUTOMATION	Y movement assembly Fail marker	
Copyright (C) All rights reserved			Size: A3	
Scale 1:3	Mass: kg 0	Metric:mm	Page 2/2	Item code . Ver OM017792.0 Rev. 5

Rev:	Revision note:	Designed	Drawn
1	-	unknown1 23.09.2011	
2	-	unknown1 23.09.2011	
3	update	unknown1 20.10.2011	





No.	Ref	Code	Ver	Rev	TITLE	TITLE2	QTY	Ft	S
1		OM017756	0	1	Frame plate	Fail marker	1	P	Yes
2		OM009293	0	0	Linear guide		2	P	Yes
3		OM017758	0	1	Fastening flange	Fail marker assy	1	P	Yes
4		OM017763	0	4	x-movement assembly	fail marker assy	1	A	Yes
5		OM017759	0	0	Belt bracket	Fail marker assy	1	P	Yes
6		OM019281	0	1	Connection plate for belt		1	P	Yes
7		OM017760	0	1	Frame bracket	Fail marker assy	2	P	Yes
8		OM017762	0	0	Mounting flange for energy chain	Fail marker assy	1	P	Yes
9		MAC01465	0	14	Hex socket head cap screw	M3x20 DIN 912 SM	2		
10		MAC01461	0	2	Hex socket head cap screw	M3x12 DIN 912 SM	8	P	
11		MAC01478	0	2	Hex socket head cap screw	M4x12 DIN 912 SM	2	P	
12		MAC01504	0	2	Hex socket head cap screw	M5x16 DIN 912 SM	4	P	
13		MAC01445	0	2	Hex socket head cap screw	M2.5x8 DIN 912 SM	16	P	
14		MAC01911	0	2	Socket low head cap screw	M3x10 DIN 7984 SM	40	P	Yes
15		MAC01565	0	14	Hex socket countersunk head screw	M3x8 DIN 7991 SM	2	P	Yes
16		MAC0572	0	5	Cylindrical pin	4m6x16 DIN 7	4	P	Yes
17		MAC0577	0	5	Cylindrical pin	5m6x18 DIN 7	4	P	Yes
18		MAC01529	0	2	Hex socket head cap screw	M6x20 DIN 912 SM	6	P	
19		MAC01465	0	2	Hex socket head cap screw	M3x20 DIN 912 SM	2	P	
20		OM019335	0	0	Identification plate		1	P	Yes
21		TMAC0165	0	2	Hex socket head cap screw	M2x8 DIN 912 SM	2	P	
22		MAC0616	0	0	Vibration absorbers	D=8, H=8, M3x6	2	P	Yes
23		OM019347	0	0	Bracket		2	P	Yes
24		2200023314	0	0	Spacer screw M3 L=7, plastic black	M3 SW6 5.43.070	3	P	
25		MAC01709	0	3		M3x5 ISO 7380 SS	3	P	Yes
26		MAC01472	0	2	Hex socket head cap screw	M3x6 DIN 912 SM	2	P	

Revision note:

Standard:

Designed: unknown1

Drawn: lamsjuh 21.10.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT automation

x-movement mechanics
fail marker assy

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:3	0		1/4	OM017764.0	4

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Rev:	Revision note:	Designed	Drawn
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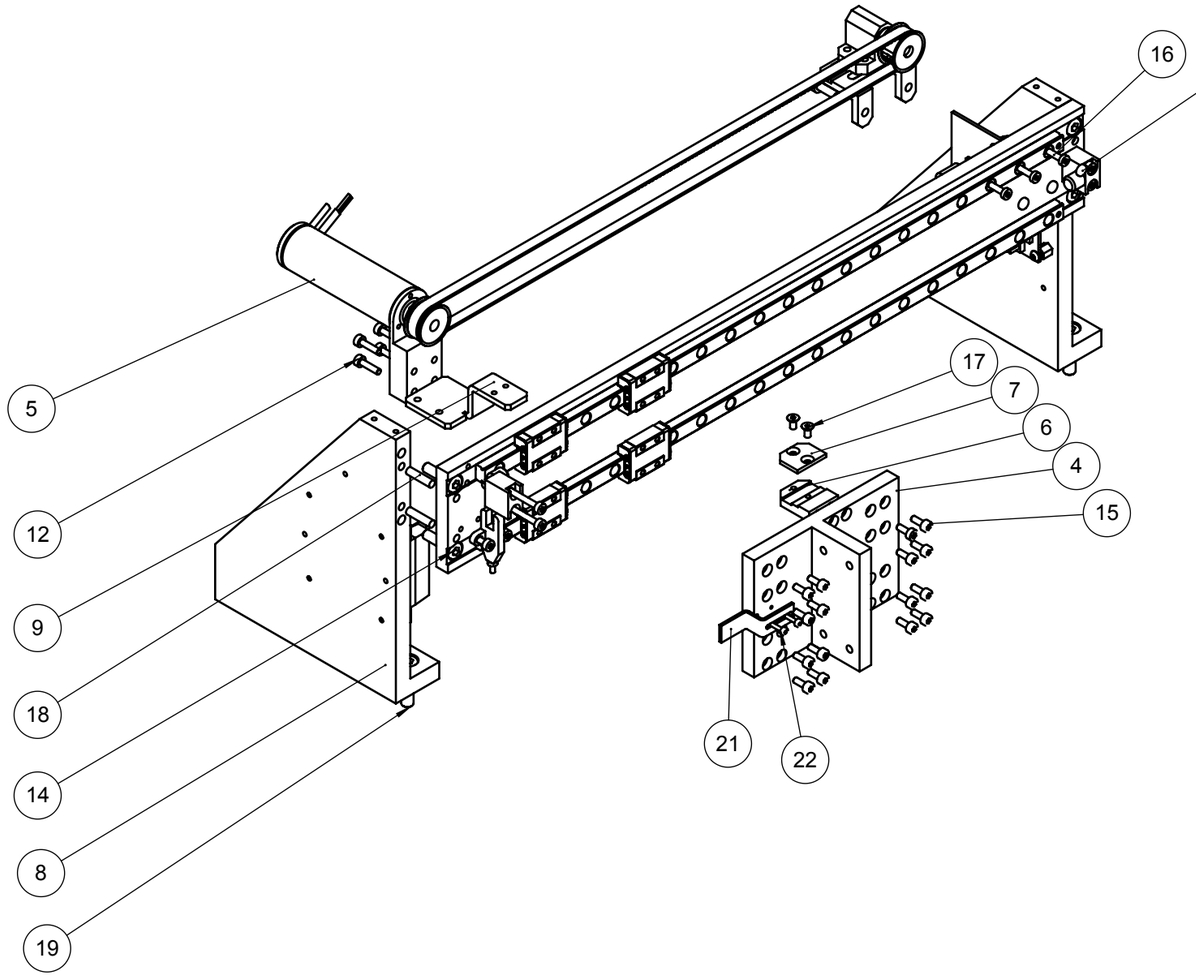
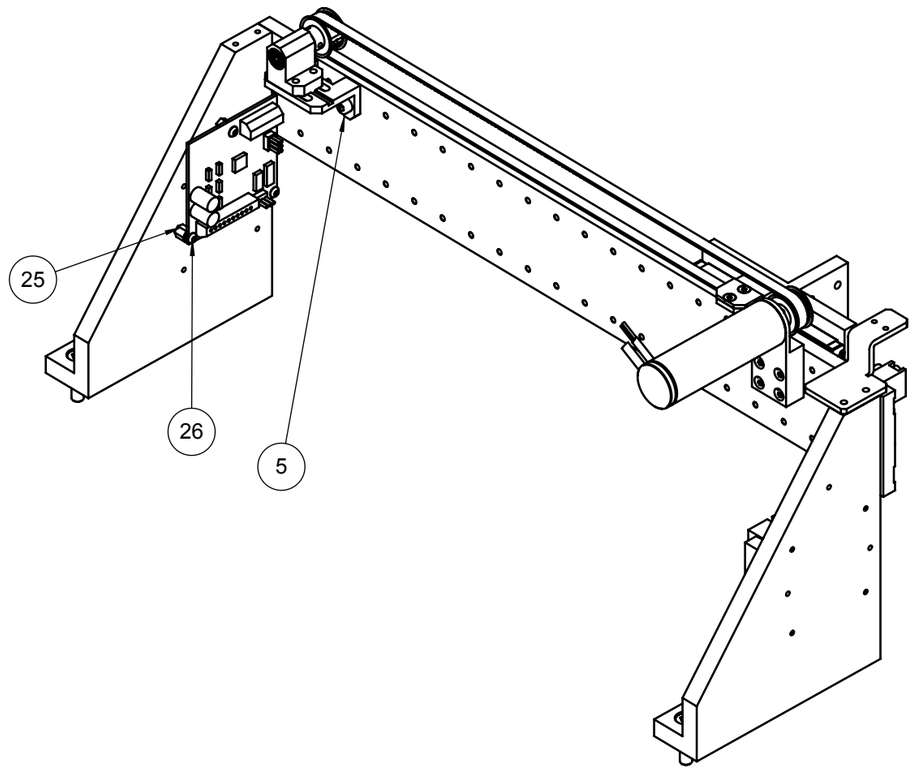
2	-	unknown1 23.09.2011	
3	update	unknown1 20.10.2011	





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Revision note:			
Standard:	Designed: unknown1	Material: Unspecified	
	Drawn: lamsjuh 21.10.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	x-movement mechanics fail marker assy	
Copyright (C) All rights reserved		Size: A3	
Scale 1:3 / Mass: kg 0 / Metric:mm		Page 2/4	Item code . Ver: OM017764.0 / Rev.: 4

Rev:	Revision note:	Designed	Drawn
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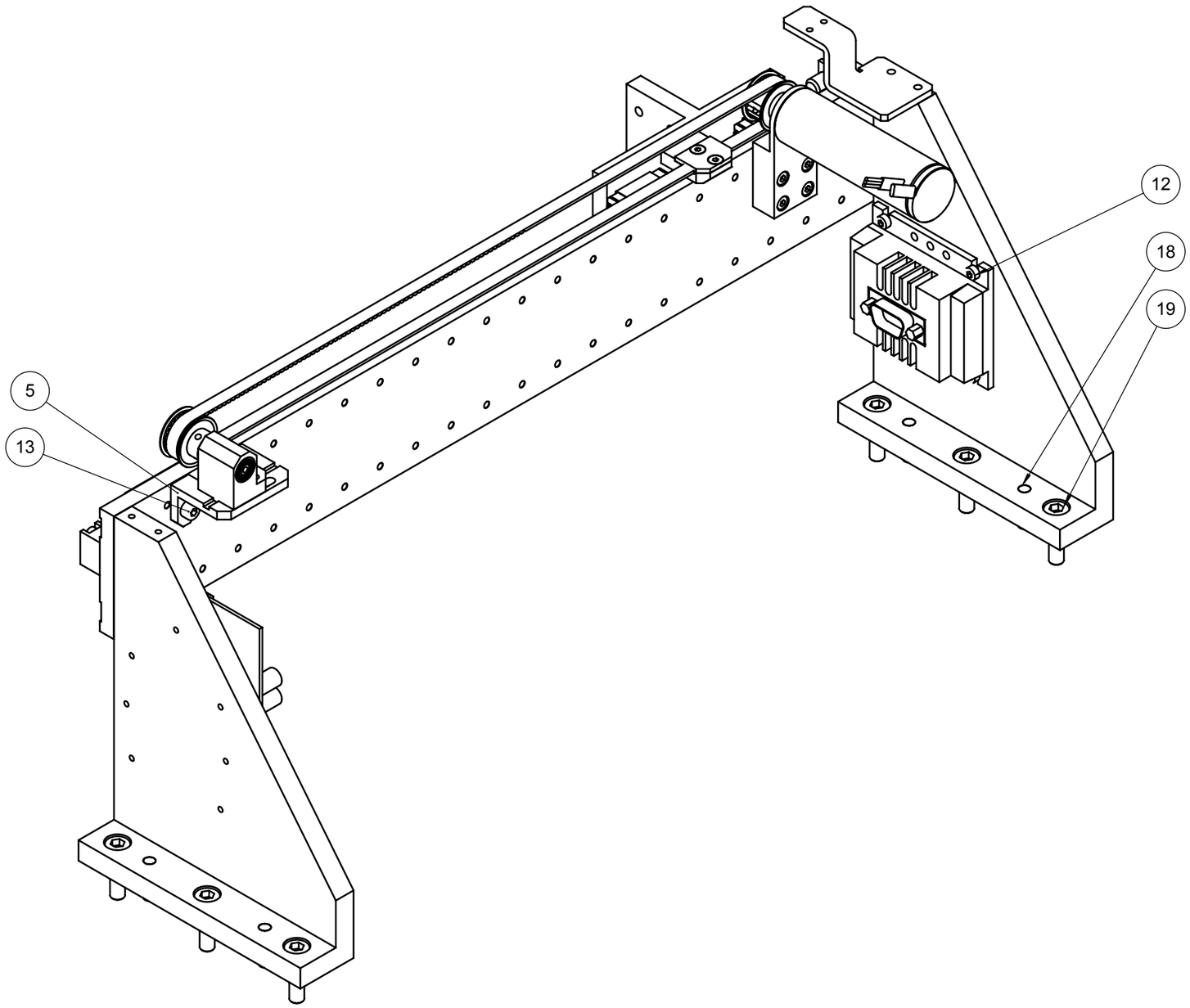
2	-	unknown1 23.09.2011	
3	update	unknown1 20.10.2011	



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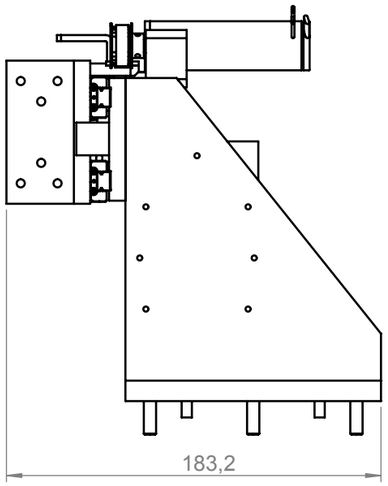
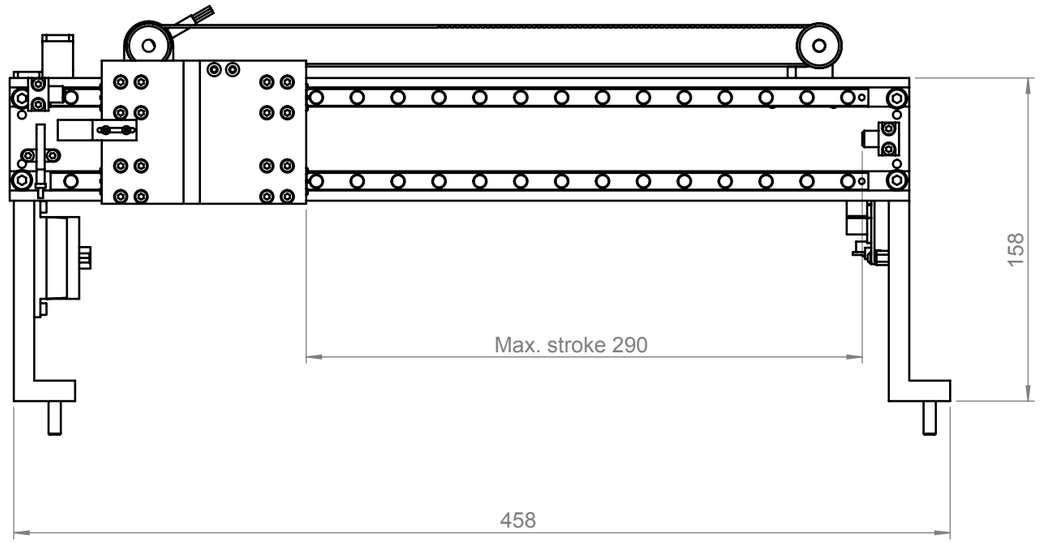
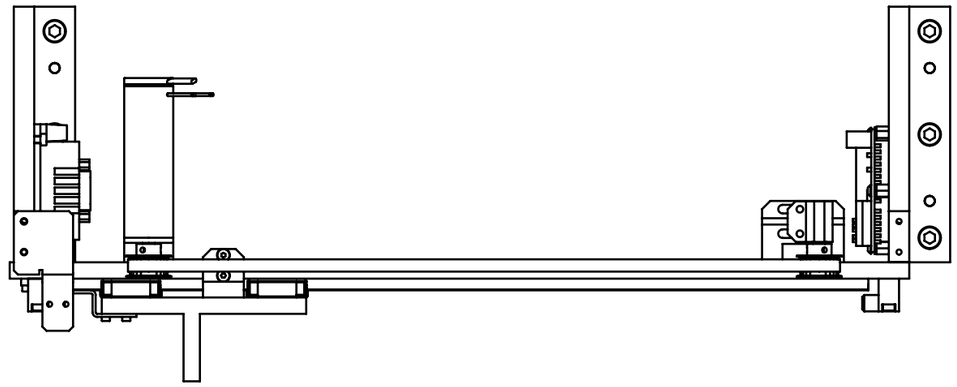
Revision note:			
Standard:	Designed: unknown1	Material: Unspecified	
	Drawn: lamsjuh 21.10.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	x-movement mechanics fail marker assy	
Copyright (C) All rights reserved		Size: A3	
Scale: 1:2 / Mass: kg: 0 / Metric:mm		Page: 3/4	Item code . Ver: OM017764.0 / Rev.: 4

Rev:	Revision note:	Designed	Drawn
1	-	unknown1 23.09.2011	
2	-	unknown1 23.09.2011	
3	update	unknown1 20.10.2011	







Revision note:			
Standard:	Designed: unknown1	Material: Unspecified	
	Drawn: lamsjuh 21.10.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	x-movement mechanics fail marker assy	
Copyright (C) All rights reserved		Size: A3	
Scale 1:3 / Mass: kg 0 / Metric:mm		Page 4/4	Item code . Ver: OM017764.0 / Rev.: 4

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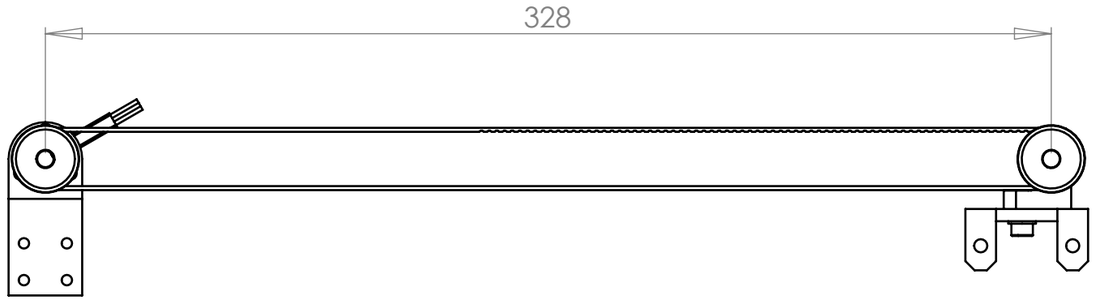
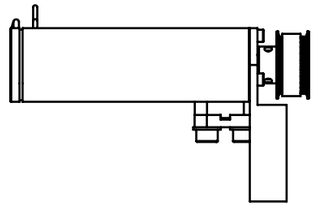
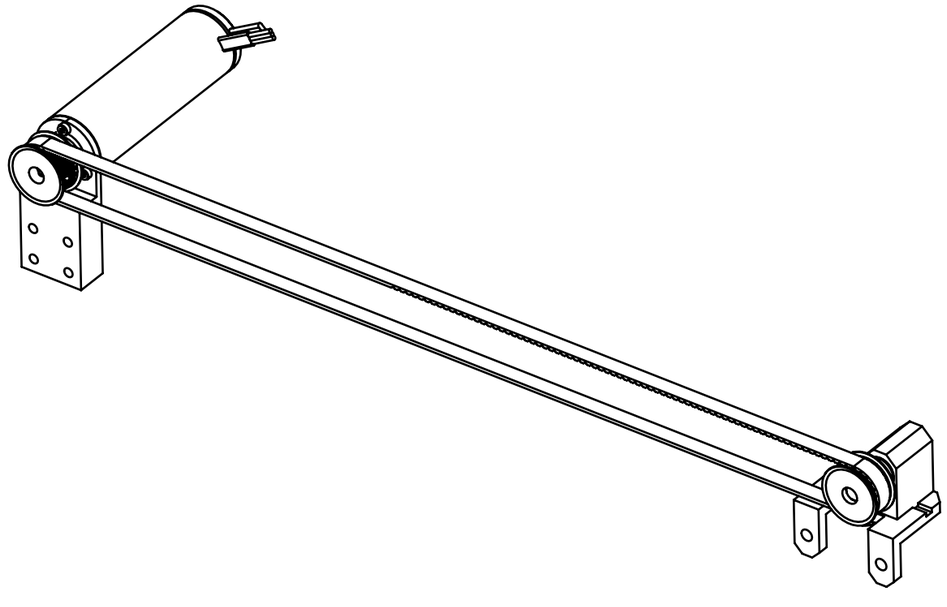
Rev:	Revision note:	Designed	Drawn
2	-	unknown1 23.09.2011	
3	turning wheel axle changed	unknown1 07.10.2011	
4	Update	unknown1 20.10.2011	







NO.	DWGNO	VER	REV	TITLE	TITLE2	Default/ QTY	FTYPE
1	MOT03100	0	0	Brushless DC-Servomotor, 36W, 24V, gear 14:1	Faulhaber 2444 S024B-K1155 + 23/1 14:1	1	P
2	OM019320	0	0	Turning wheel axle	bearing 5mm wheel 6mm	1	P
3	BEA0215	1	3	Deep groove ball bearing, single row	685ZZ, d=5mm, D=11mm, B1=5mm	2	P
4	DRI06689	0	0	Timing belt	T2,5-6_718	1	P
5	OM019131	0	0	bearing housing		1	P
6	OM017293	0	2	Turn wheel bracket	X-movement	1	P
7	OM019138	0	0	motor bracket	x-movement mechanics	1	P
8	OM017520	0	0	Belt pulley	16 T2,5 / 24-2	2	P
9	MAC01479		2	Allen Screw	M 4x 12 DIN912	2	
10			2	Allen Screw	M 3x 6 DIN912	1	
11		0	0	Plate washer	ALE 3,2A DIN125	1	
12	MAC01656	0	10	Locking screw	M3x3 DIN 913 SS	6	P
13	MAC01454	0	2	Hex socket head cap screw	M2x5 DIN 912 SM	3	P
14	MAC10028	0	0	Plate washer	ALE 4,3A DIN125	2	

Revision note:

Standard:

Designed: unknown1

Drawn: lamsjuh 20.10.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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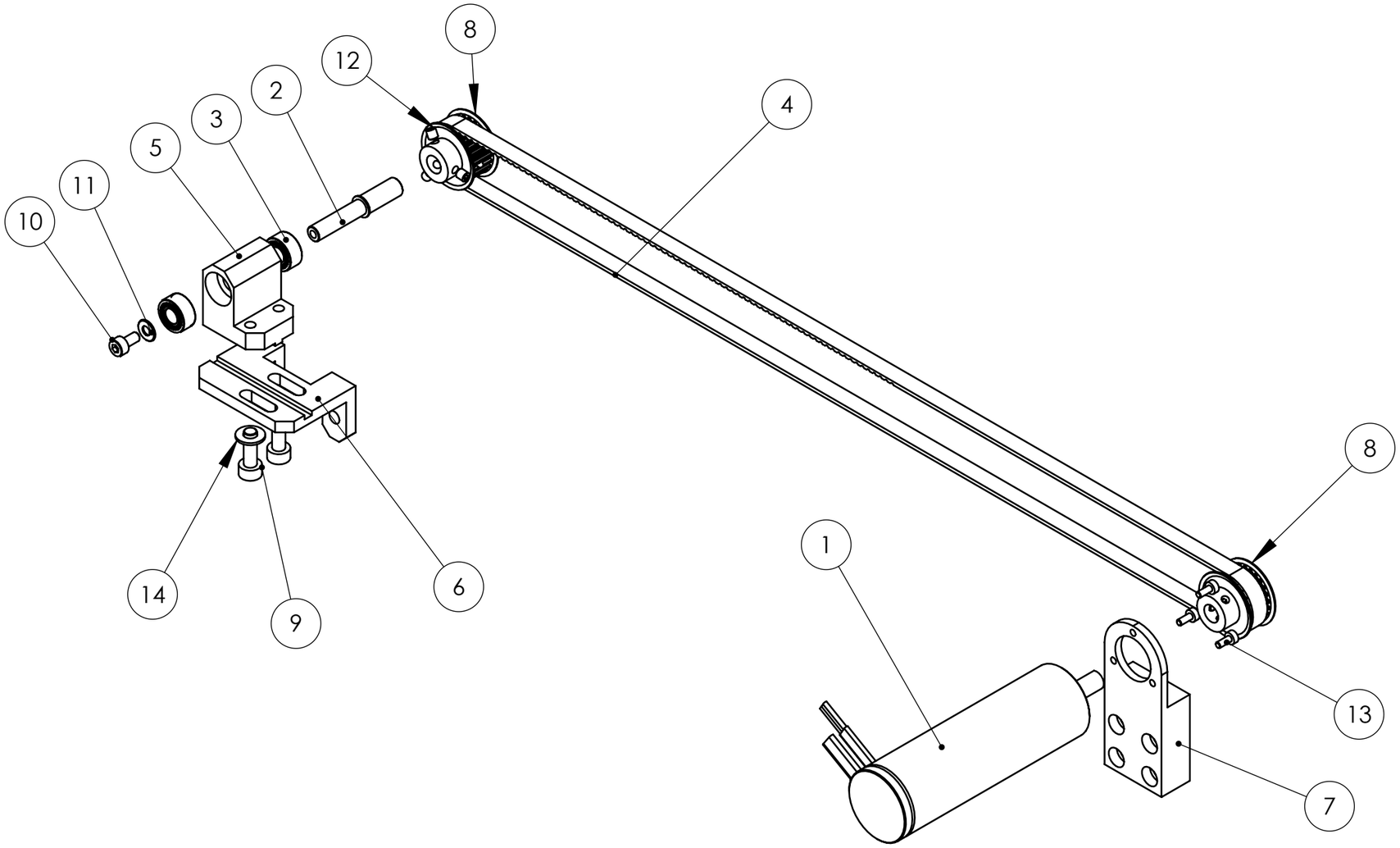
JOT automation

x-movement assembly
fail marker assy

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:2	0		1/2	OM017763.0	4

Rev:	Revision note:	Designed	Drawn
2	-	unknown1 23.09.2011	
3	turning wheel axle changed	unknown1 07.10.2011	
4	Update	unknown1 20.10.2011	



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Revision note:			
Standard:	Designed: unknown1		Material: Unspecified
	Drawn: lamsjuh 20.10.2011		Finish: Unspecified
RoHS:	JOT AUTOMATION	x-movement assembly fail marker assy	
Copyright (C) All rights reserved		Size: A3	
Scale 1:1.5 / Mass: kg 0 / Metric:mm		Page 2/2	Item code . Ver: OM017763.0 / Rev. 4

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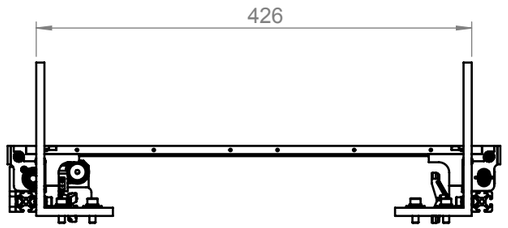
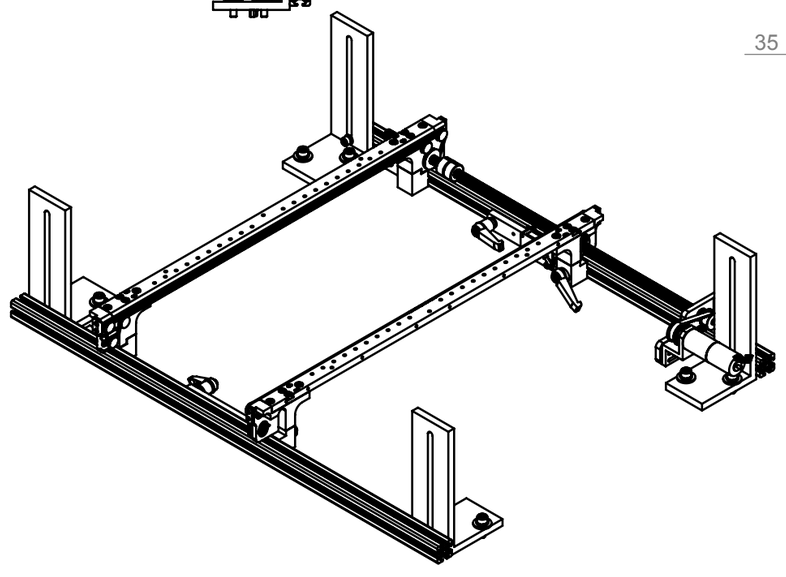
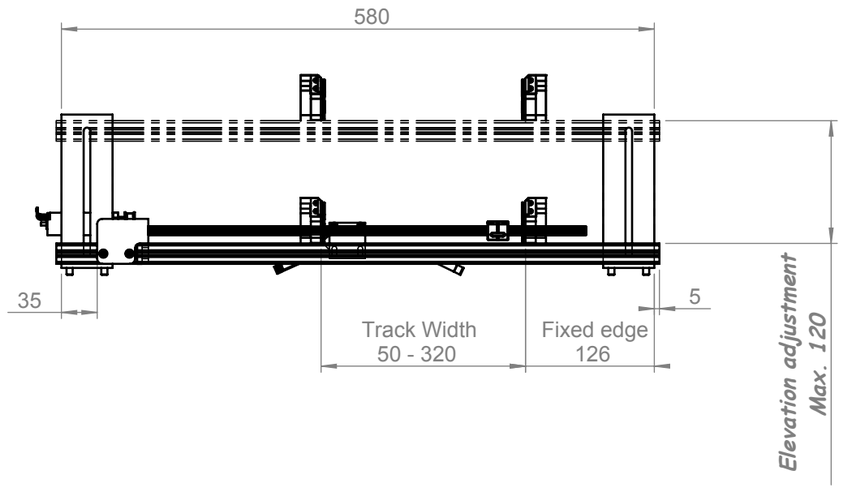
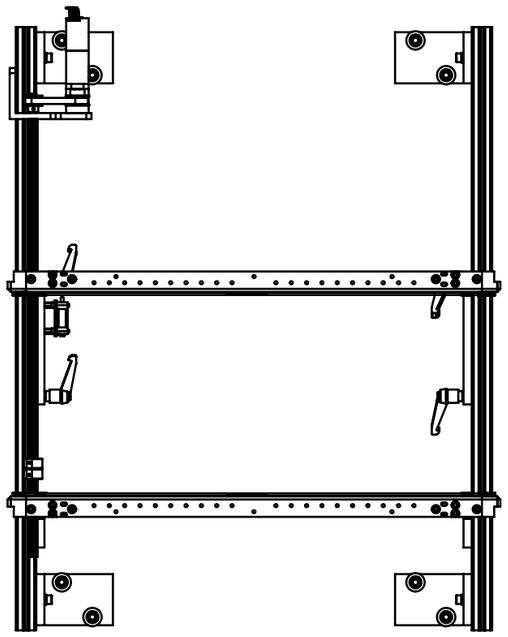
Rev:	Revision note:	Designed	Drawn
1	Assembly updated	koskema 26.07.2011	









NO.	DWGNO	VER	REV	TITLE	TITLE2	QTY	FTYPE
1	OM019037	0	0	Conveyor block, Fixed edge		1	A
2	OM019036	0	0	Conveyor block, Moving edge		1	A
3	OM018591	0	0	Transmission assembly		1	A
4	EM013823	0	0	Aluminium profil	ITEM0.0.370.03 Profile 5(20x20) - 590mm	2	P
5	EM013818	0	2	Angle Bracket	L150x75x8-53	4	P
6	EM045884	0	1	Sensor Holder	PLT2-38x38	1	P
7	OM019054	0	0	Connector plate	Mirrored	1	P
8	OM019054	0	0	Connector plate		1	P
9	MAC01527	0	21	Hex socket head cap screw	M6x18 DIN 912 SS	8	
10	MAC01503	0	21	Hex socket head cap screw	M5x16 DIN 912 SS	4	
11	MAC01757	0	21	Hex socket head cap screw	M3x14 DIN 912 SS	2	
12	MAC01474	0	21	Hex socket head cap screw	M3x8 DIN 912 SS	2	
13	MAC10049	0	9	Split lock washer with bend ends	M6 DIN 127 SS	8	P
14	MAC10048	0	9	Split lock washer with bend ends	M5 DIN 127 SS	4	P
15	MAC10057	0	10	Washer, plain, large	M6 DIN 9021 SS	8	P
16	MAC10030	0	19	Flat washer without chamfer	M5 DIN 125 SS	8	
17	MAC10026	0	19	Flat washer without chamfer	M3 DIN 125 SS	2	
18	MAT0144	0	0	T-Slot Nut 5 St M5	ITEM 0.0.370.01 (M5)	8	P
19	OM016173	0	0	Support plate		1	P
20	OM019053	0	0	Fastening plate		1	P
21	OM019053	0	0	Fastening plate	Mirrored	1	P
22	TMAC0711	0	0	Spacer screw L=10 mm	M3-SW5.5 5.13.101	2	P
23	MAC0757	0	0	Clamp lever, black	KIPP 50 105 015 01	4	P
24	MAT0134	0	2	T-Slot Nut 5 St M4	ITEM 0.0.370.06 (M4)	6	P
25	MAC01927	0	2	Socket low head cap screw	M4x8 DIN 7984 SM	6	P

Revision note:

Standard:

Designed: vesapaa 01.03.2011

Drawn: koskema 26.07.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT automation

Return conveyor assembly

Scale	Mass: kg	Metric:mm	Size: A3	
1:6	6,6902		Page 1/2	Item code . Ver: OM018595.0 / Rev.: 1

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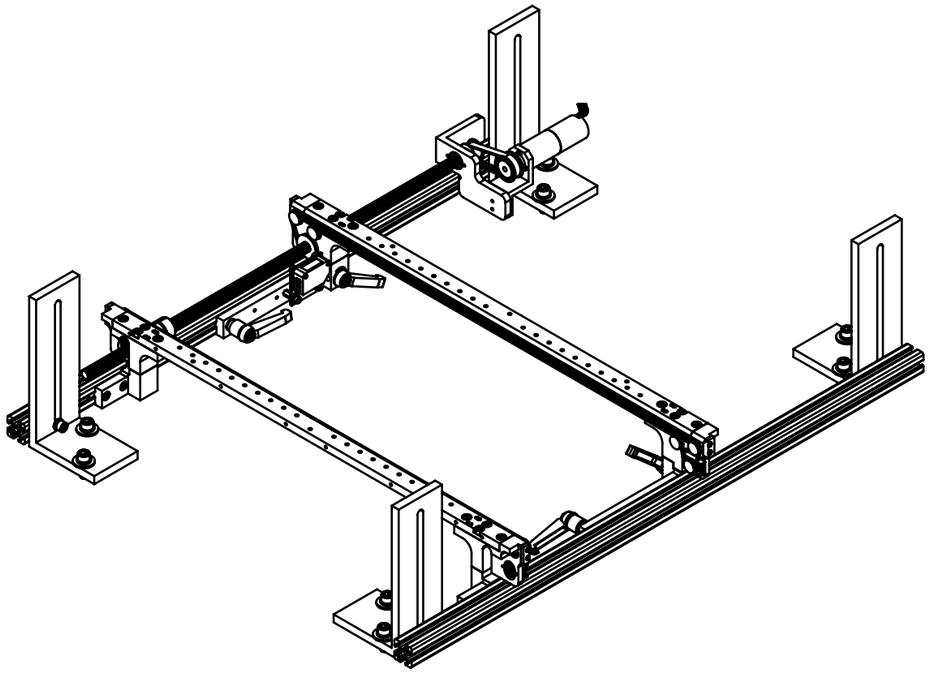
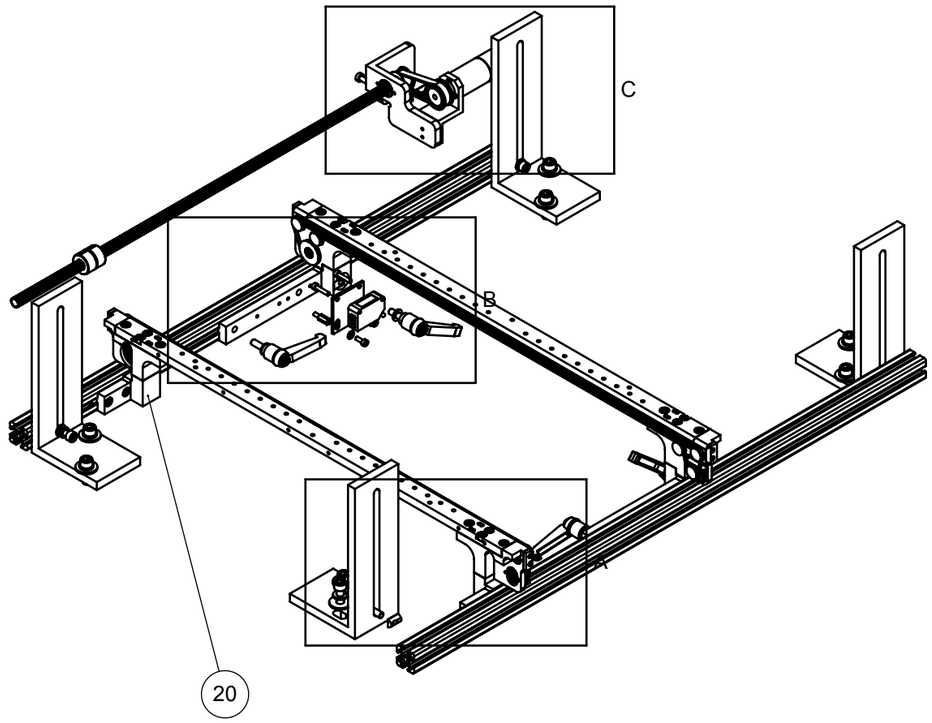
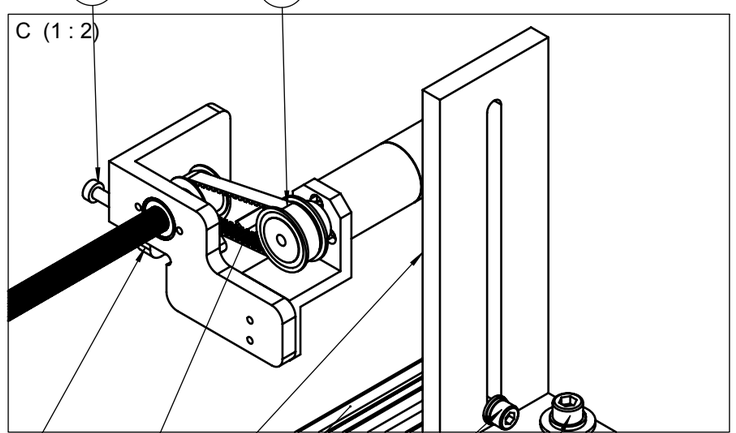
Rev:	Revision note:	Designed	Drawn
1	Assembly updated	koskema 26.07.2011	

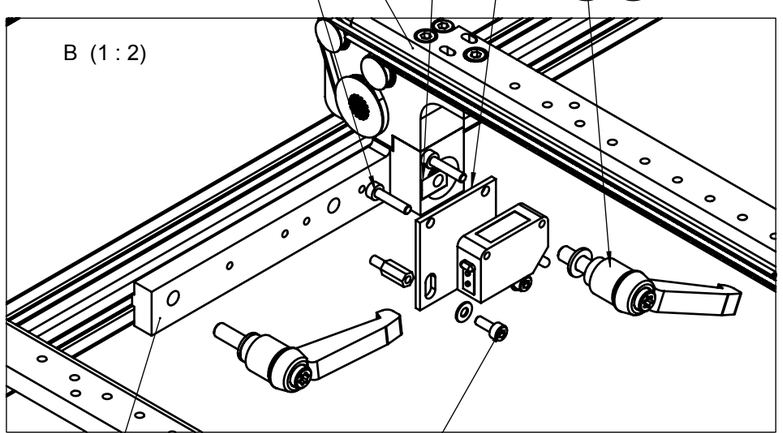




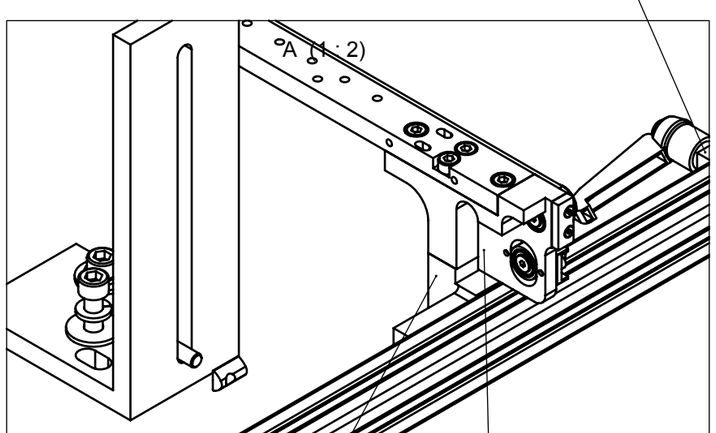
C (1 : 2)



B (1 : 2)



A (1 : 2)



Revision note:				
Standard:		Designed: vesapaa 01.03.2011	Material: Unspecified	
		Drawn: koskema 26.07.2011	Finish: Unspecified	
RoHS:		JOT automation	Return conveyor assembly	
Copyright (C) All rights reserved			Size: A3	
Scale 1:5	Mass: kg 6,6902	Metric:mm	Page 2/2	Item code . Ver: OM018595.0 Rev.: 1

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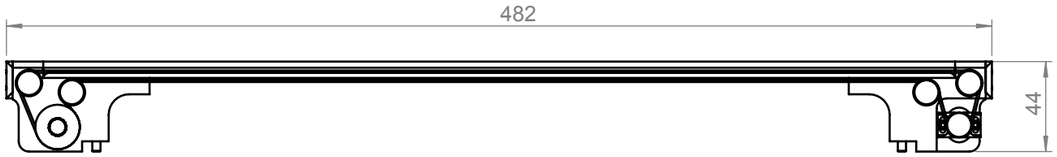
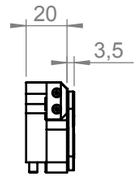
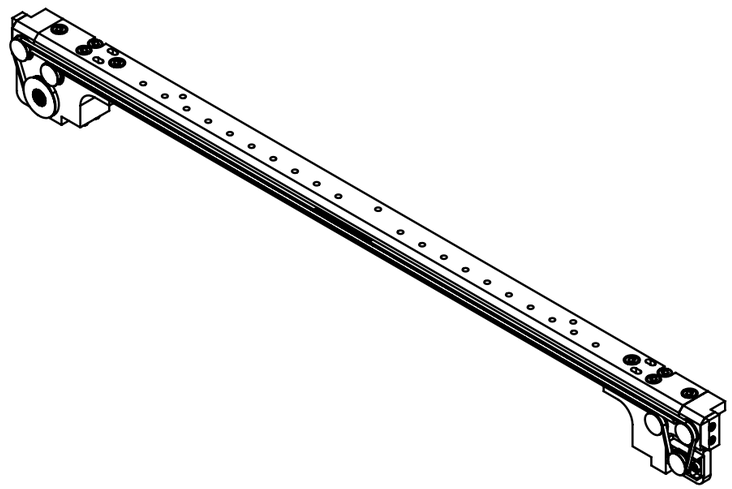
Rev:	Revision note:	Designed	Drawn
1	Added gluing instruction	unknown1 23.11.2011	







NO.	DWGNO	VER	REV	TITLE	TITLE2	QTY	FTYPE
1	OM019035	0	1	Drive block, 2		1	P
2	OM019026	0	0	Frame plate		1	P
3	OM019027	0	0	Pulley		5	P
4	DRI06687	0	0	Timing belt	516 MXL widht 2,3mm	1	P
5	OM019031	0	1	Spline bushing	Misumi TSPHB8	1	P
6	OM019030	0	1	Toothed wheel	7,5MXL 32-0	1	P
7	BEA06254	0	0	Ball Bearing MR105ZZ	D=10 d=5 B=4	10	P
8	OM019029	0	1	Bearing housing		1	P
9	BEA06186	0	2	Deep groove ball bearing, single row	INA 61801 2Z	1	P
10	OM019032	0	1	Tension block, 1		1	P
11	OM019028	0	0	Guide plate		2	P
12	TMAC023	0	4	External retaining ring	12x1 DIN 471	1	P
13	MAC01564	0	13	Hex socket countersunk head screw	M3x6 DIN 7991 SS	5	P
14	MAC01554	0	13	Hex socket countersunk head screw	M2x6 DIN 7991 SS	4	P
15	MAC01761	0	21	Hex socket head cap screw	M3x3 DIN 912 SS	1	
16	MAC01476	0	21	Hex socket head cap screw	M4x10 DIN 912 SS	4	
17	MAC01492	0	21	Hex socket head cap screw	M4x40 DIN 912 SS	4	
18	MAC01471	0	21	Hex socket head cap screw	M3x5 DIN 912 SS	1	
19	MAC01444	0	21	Hex socket head cap screw	M2.5x6 DIN 912 SS	2	
20	MAC0563	0	5	Cylindrical pin	3m6x10 DIN 7	4	P

Revision note: Created

Standard:

Designed: Lamsaju2 17.06.2011

Drawn: lamsjuh 23.11.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT AUTOMATION

Conveyor block, Fixed edge

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:3	0		1/3	OM019037.0	1

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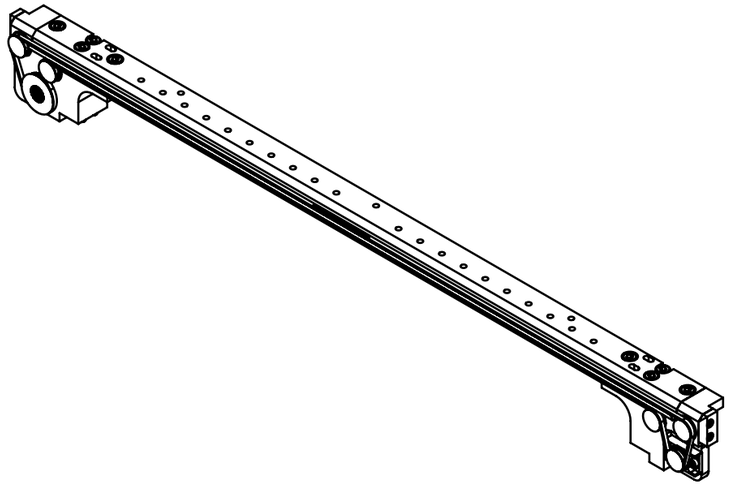
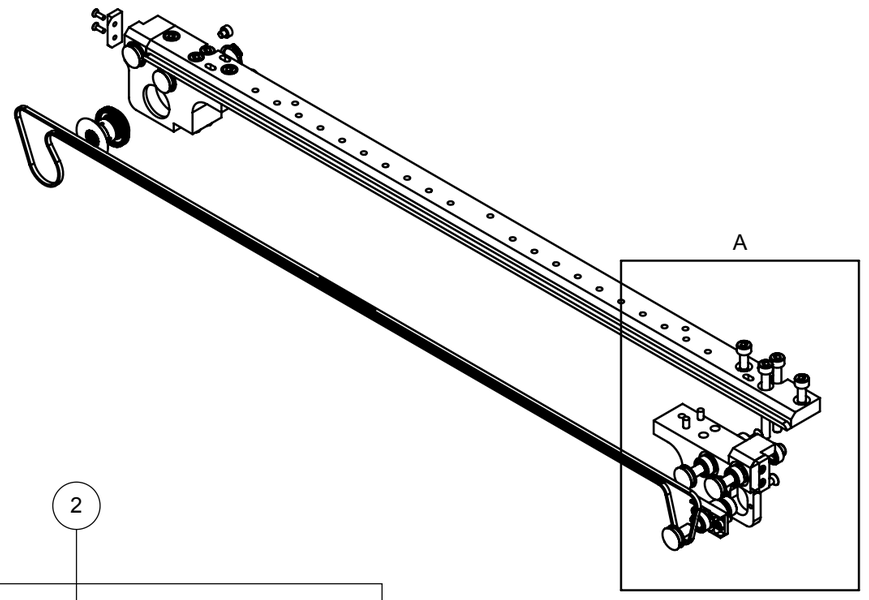
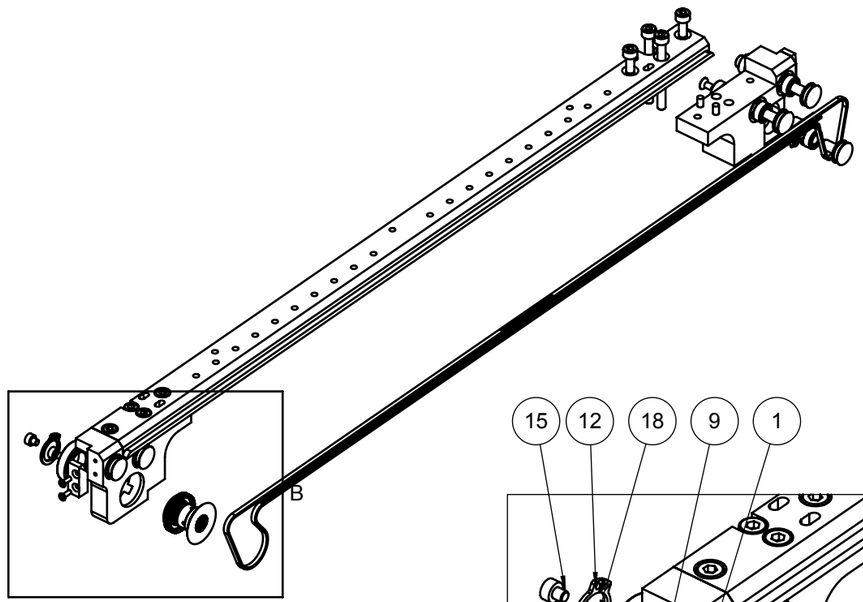
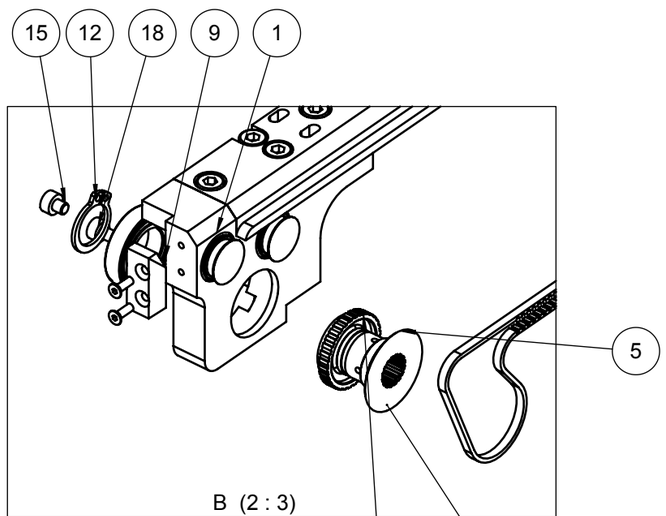
Rev:	Revision note:	Designed	Drawn
1	Added gluing instruction	unknown1 23.11.2011	

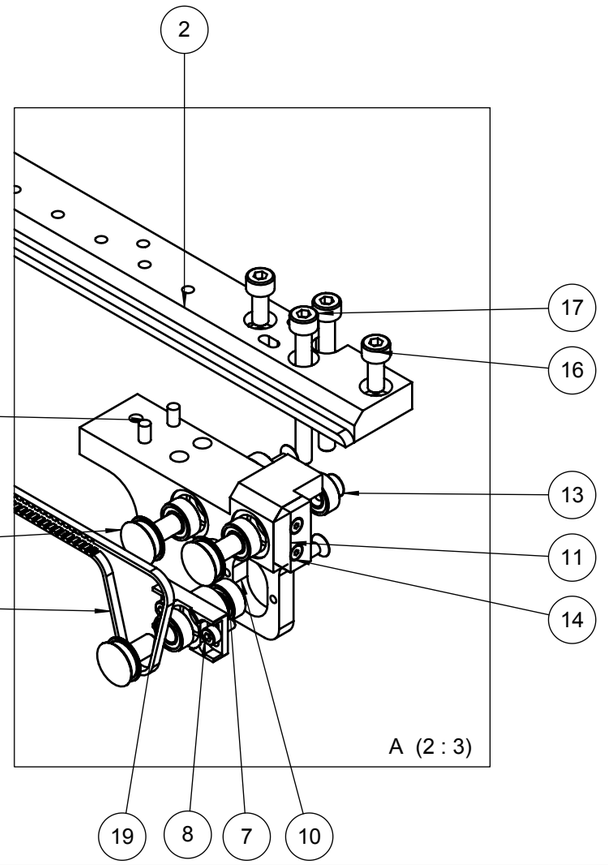








Hox.
Use glue to fix parts 5 and 6 together.



Revision note: Created			
Standard:	Designed: Lamsaju2 17.06.2011	Material: Unspecified	
	Drawn: lamsjuh 23.11.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	Conveyor block, Fixed edge	
Copyright (C) All rights reserved		Size: A3	
Scale 1:3 / Mass: kg 0 / Metric:mm		Page 2/3	Item code . Ver: OM019037.0 / Rev.: 1

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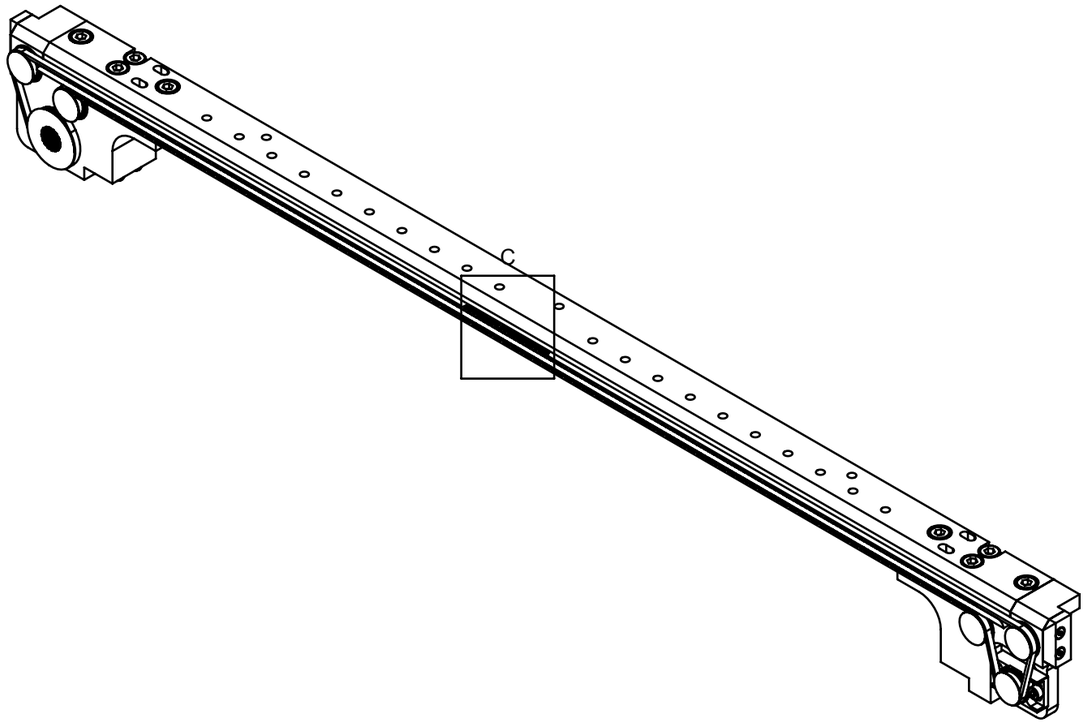
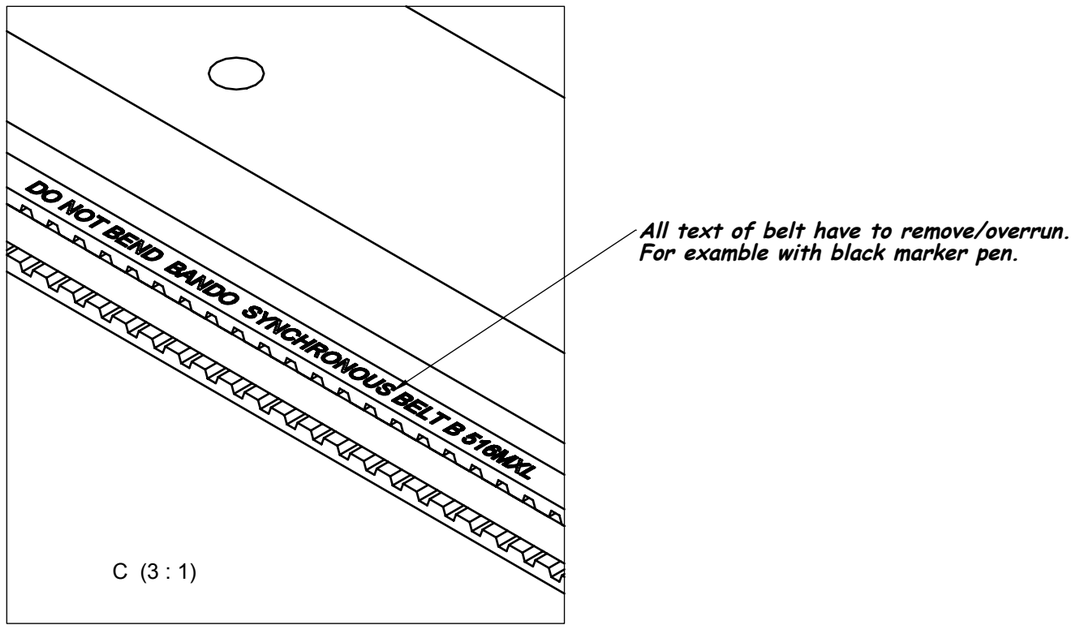
Rev:	Revision note:	Designed	Drawn
1	Added gluing instruction	unknown1 23.11.2011	





C (3 : 1)

Revision note: Created				
Standard:		Designed: Lamsaju2 17.06.2011	Material: Unspecified	
		Drawn: lamsjuh 23.11.2011	Finish: Unspecified	
RoHS:		JOT AUTOMATION	Conveyor block, Fixed edge	
Copyright (C) All rights reserved			Size: A3	
Scale 1:2	Mass: kg 0	Metric:mm	Page 3/3	Item code . Ver OM019037.0 / Rev. 1

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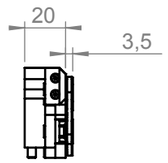
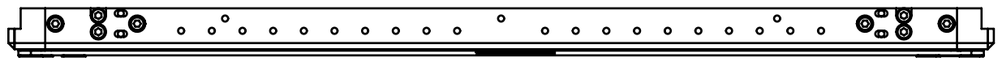
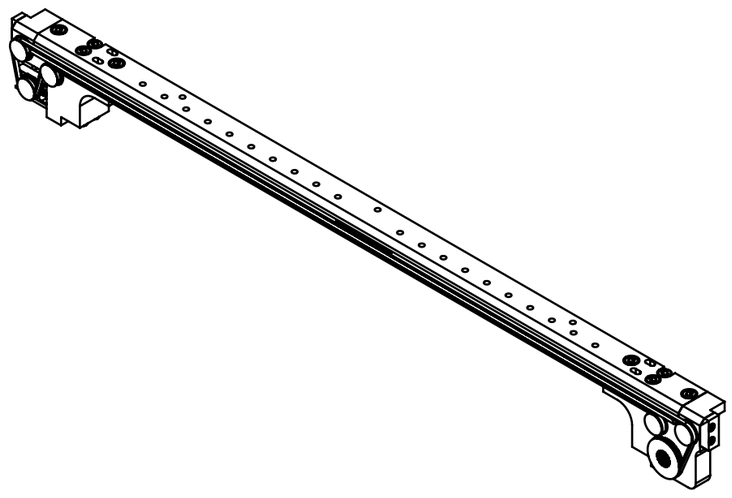
Rev:	Revision note:	Designed	Drawn
1	Added gluing instruction	unknown1 23.11.2011	







NO.	DWGNO	VER	REV	TITLE	TITLE2	QTY	FTYPE
1	OM019034	0	1	Drive block, 1		1	P
2	OM019030	0	1	Toothed wheel	7,5MXL 32-0	1	P
3	BEA06186	0	2	Deep groove ball bearing, single row	INA 61801 2Z	1	P
4	OM019031	0	1	Spline bushing	Misumi TSPHB8	1	P
5	OM019033	0	1	Tension block, 2		1	P
6	BEA06254	0	0	Ball Bearing MR105ZZ	D=10 d=5 B=4	10	P
7	OM019027	0	0	Pulley		5	P
8	OM019026	0	0	Frame plate		1	P
9	OM019029	0	1	Bearing housing		1	P
10	DRI06687	0	0	Timing belt	516 MXL widht 2,3mm	1	P
11	OM019028	0	0	Guide plate		2	P
12	MAC0563	0	5	Cylindrical pin	3m6x10 DIN 7	4	P
13	MAC01476	0	21	Hex socket head cap screw	M4x10 DIN 912 SS	4	
14	MAC01492	0	21	Hex socket head cap screw	M4x40 DIN 912 SS	4	
15	MAC01444	0	21	Hex socket head cap screw	M2.5x6 DIN 912 SS	2	
16	MAC01471	0	21	Hex socket head cap screw	M3x5 DIN 912 SS	2	
17	TMAC023	0	4	External retaining ring	12x1 DIN 471	1	P
18	MAC01564	0	13	Hex socket countersunk head screw	M3x6 DIN 7991 SS	5	P
19	MAC01554	0	13	Hex socket countersunk head screw	M2x6 DIN 7991 SS	4	P

Revision note:

Standard:

Designed: Lamsaju2 15.06.2011

Drawn: lamsjuh 23.11.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT automation

Conveyor block, Moving edge

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:3	0		1/3	OM019036.0	1

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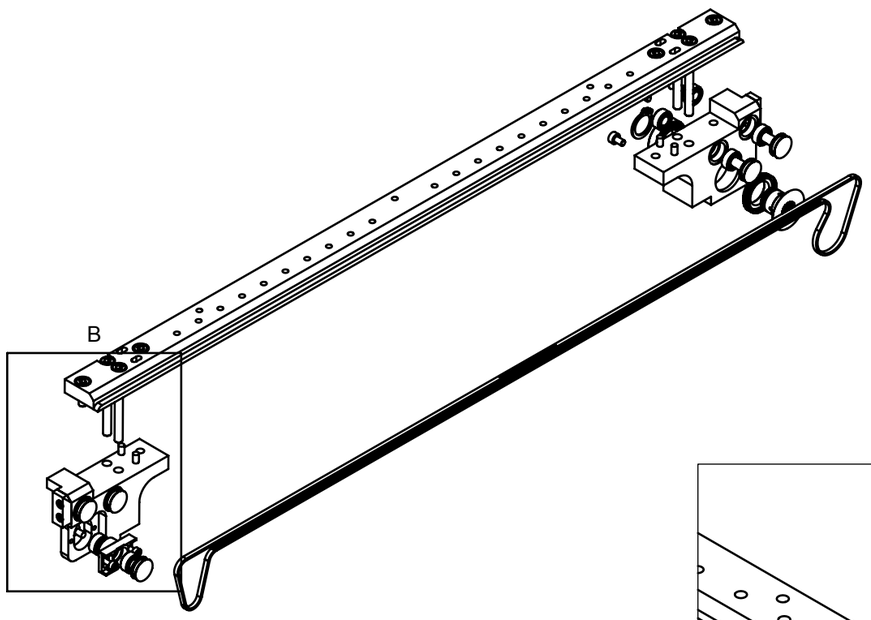
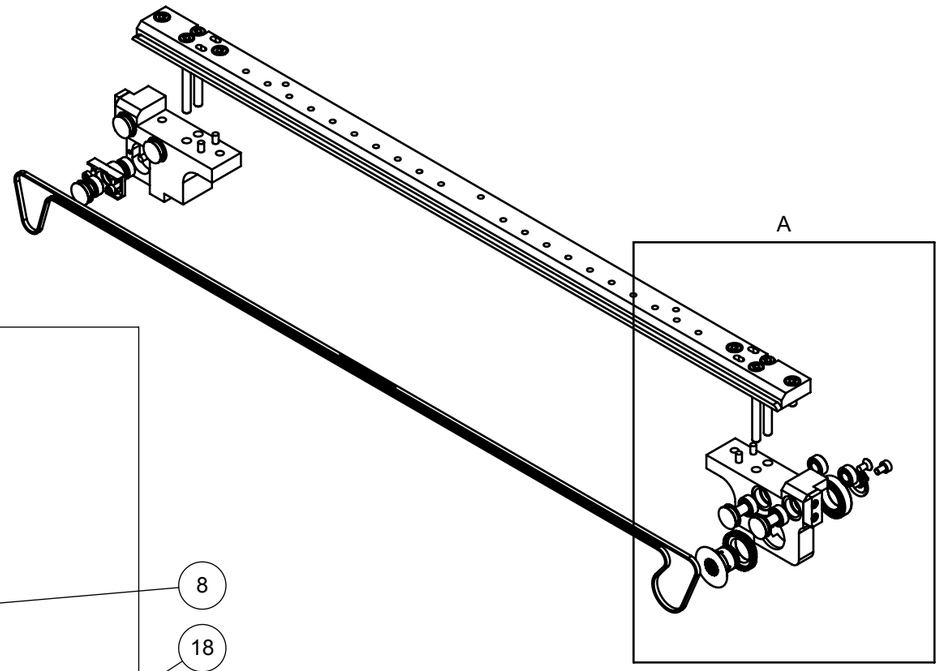
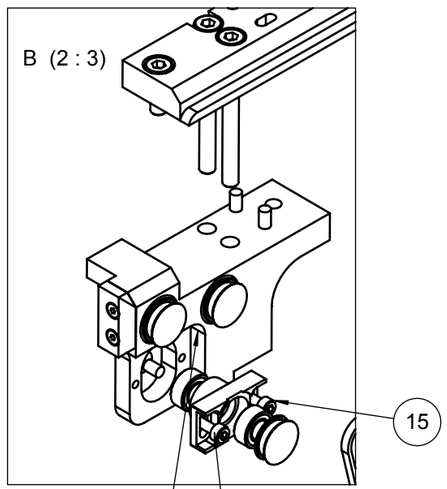
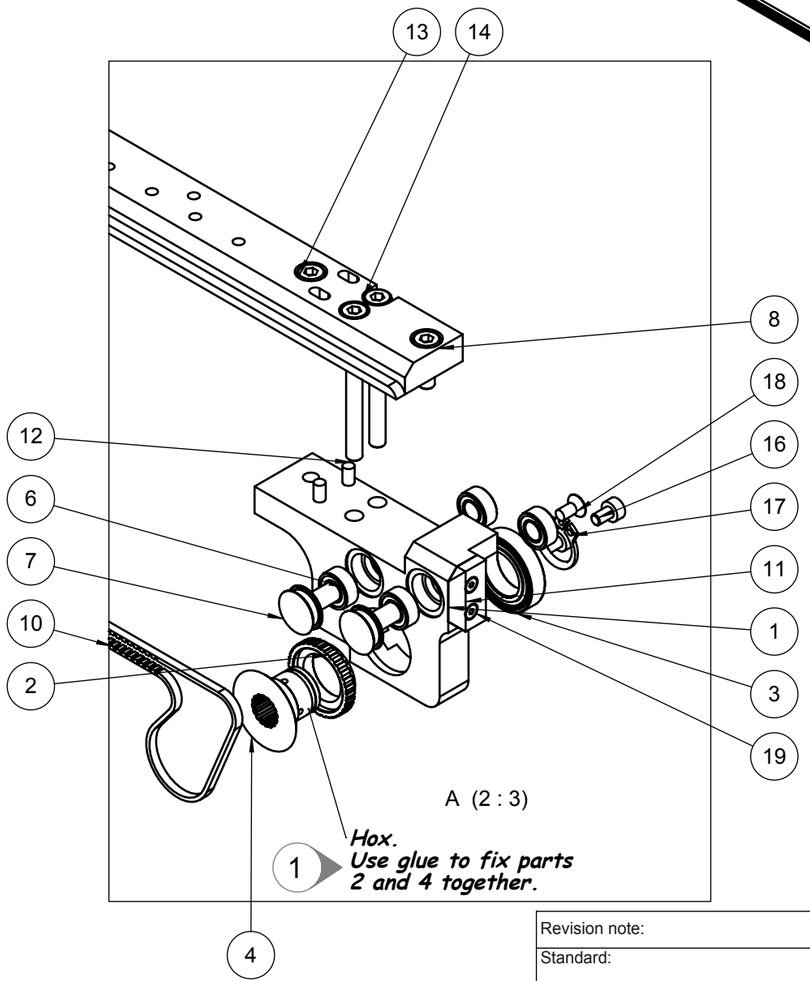
Rev:	Revision note:	Designed	Drawn
1	Added gluing instruction	unknown1 23.11.2011	



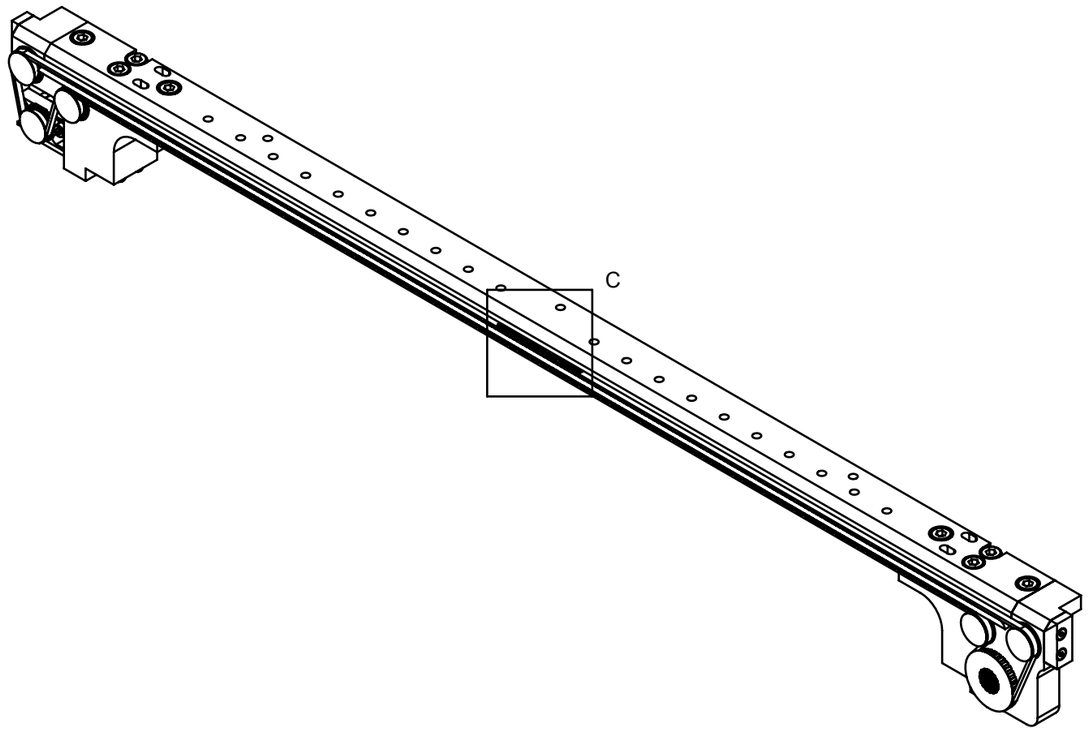


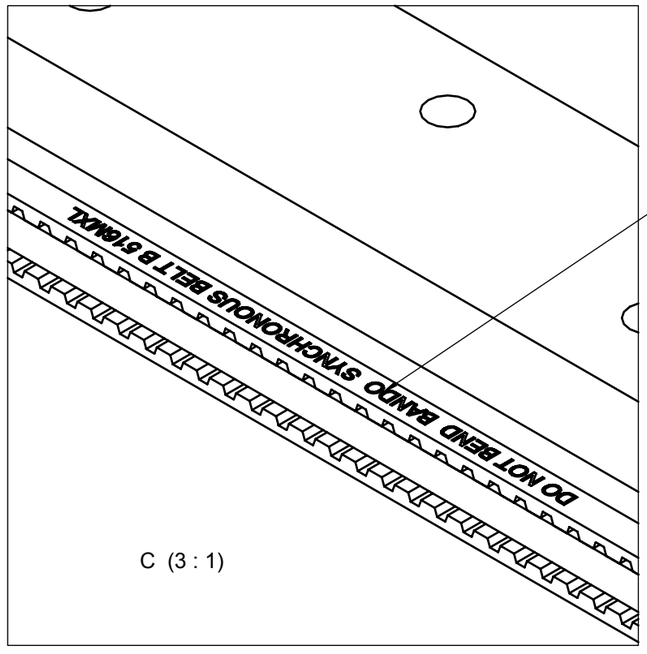




Revision note:			
Standard:	Designed: Lamsaju2 15.06.2011	Material: Unspecified	
	Drawn: lamsjuh 23.11.2011	Finish: Unspecified	
RoHS:	JOT automation	Conveyor block, Moving edge	
Copyright (C) All rights reserved		Size: A3	
Scale 1:3 / Mass: kg 0 / Metric:mm		Page 2/3	Item code . Ver: OM019036.0 / Rev. 1

Rev:	Revision note:	Designed	Drawn
1	Added gluing instruction	unknown1 23.11.2011	





C (3 : 1)

All text of belt have to remove/overrun.
For examble with black marker pen.

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Revision note:			
Standard:	Designed: Lamsaju2 15.06.2011	Material: Unspecified	
	Drawn: lamsjuh 23.11.2011	Finish: Unspecified	
RoHS:	JOT AUTOMATION	Conveyor block, Moving edge	
Copyright (C) All rights reserved		Size: A3	
Scale 1:2 / Mass: kg 0 / Metric:mm		Page 3/3	Item code . Ver: OM019036.0 / Rev. 1

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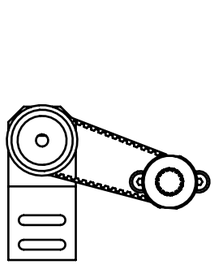
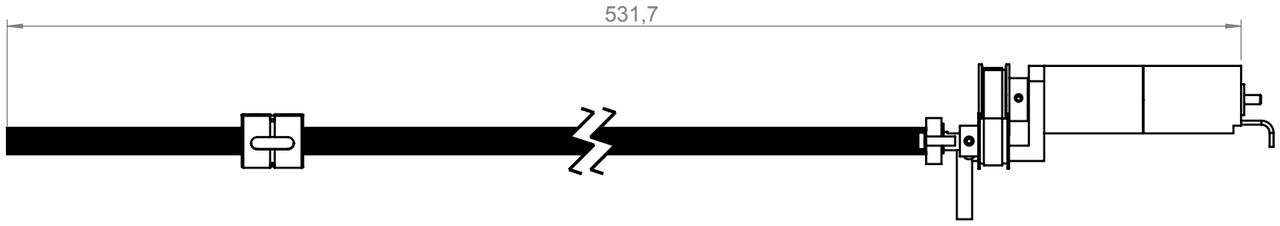
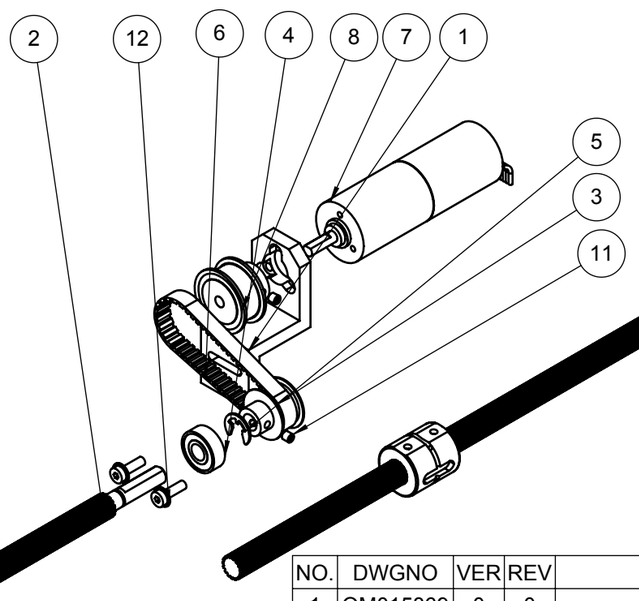
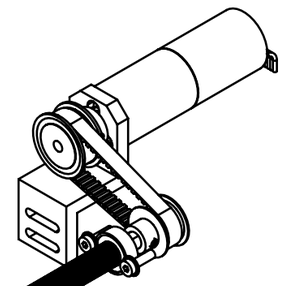
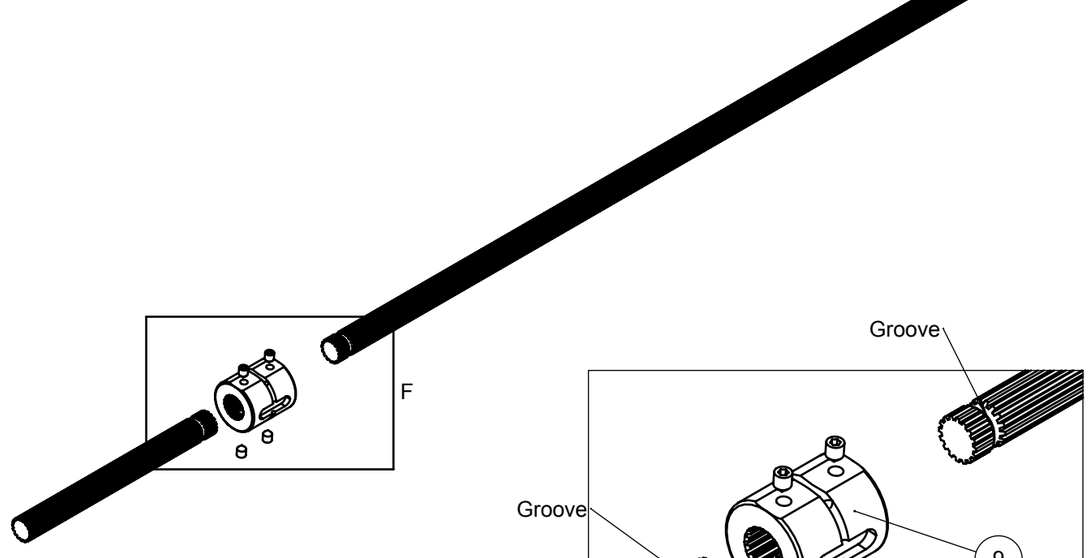
Rev:	Revision note:	Designed	Drawn
1	Screws changed	unknown1 01.11.2011	

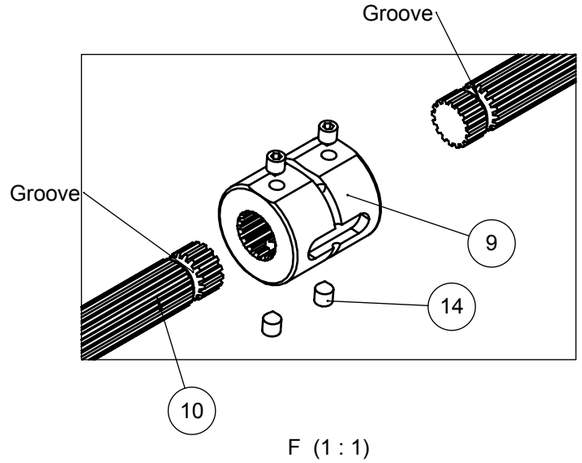












F (1 : 1)

NO.	DWGNO	VER	REV	TITLE	TITLE2	QTY	FTYPE
1	OM015869	0	0	Motor barcket		1	P
2	OM018592	0	1	Axle machining	MISUMI TSPRW8-450-F25-V6-S0-Q6	1	P
3	EM048246	0	0	Timing Pulley	DRI05101 (Synchroflex Al 16T2.5/19-2)	1	P
4	BEA06195	0	0	Sealed single row deep groove bearing	SKF 619/6-2Z	1	P
5	TMAC0230	0	7	Lock washer	5 DIN 6799 SS	1	
6	DRI06495	0	0	Timing belt	T2,5-6_145	1	P
7	MOT0279	0	0	DC-Brushless Gearmotor, 12W, 24V, Gear 19:1	MAXON EC-Max 22 + GP 22C	1	P
8	EM049166	0	0	Machining drawing	2200002175/SYNCHROFLEX AL16T2.5/25-2	1	P
9	OM018594	0	0	Machining of sleeve	Misumi TSPB8	1	P
10	OM018593	0	2	Axle machining	MISUMI TSPR8-86	1	P
11	MAC01120	0	4	Socket set screws with cup point	M3x3 DIN 916 SS	4	P
12	MAC10026	0	19	Flat washer without chamfer	M3 DIN 125 SS	2	
13	MAC01911	0	2	Socket low head cap screw	M3x10 DIN 7984 SM	2	P
14	TMAC0113	0	2	socket set screw	M 3x 4 DIN914	4	P

1

Revision note: Created

Standard:

Designed: Lamsaju2 31.07.2009

Drawn: lamsjuh 01.11.2011

Material: Unspecified

Finish: Unspecified

RoHS:

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JOT AUTOMATION

Transmission assembly

Size: A3

Scale	Mass: kg	Metric:mm	Page	Item code . Ver	Rev.
1:2	0		1/1	OM018591.0	1

SMEMA Electrical Equipment Interface Standard

Introduction

The SMEN4A machine interface standards were developed to facilitate the interface of equipment used in the manufacture of surface-mounted printed circuit boards. This standard is for Electrical interfaces.

Purpose

The purpose of this standard is to provide an equipment specification for single board transfer manufacturing systems of surface-mounted printed circuit boards. This specification provides the minimum requirement that the equipment must meet, and does not represent a complete specification for the equipment's interface. Conformance to the standard may be achieved by the appropriate design of the equipment or by providing special adaptors which enable the equipment to meet the standard.

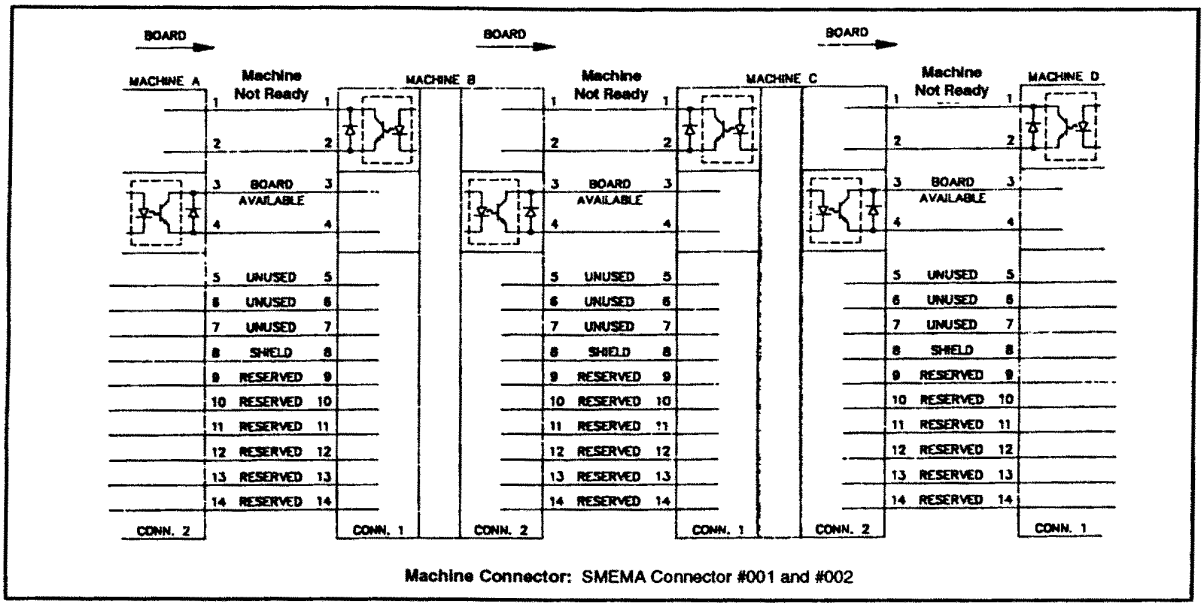

Figure 1. Electrical Interface Schematic

Specifications

A machine-to-machine electrical interface is required to insure proper sequencing of PC boards. The interface is used for "Local" control and must operate independently of the cell controller.

1.) Electrical connections	Each machine should be provided with a separate power connection and ground. Individual ON/OFF controls should also be provided.
2.) Grounding	Each machine should have 1/4-20 earth ground stud on each side (left and right) of the machine.
3.) Inter-machine **control**	To sequence boards properly from machine-to-machine, one or two signal lines will be used: "Board Not Available" and "Board Available."

These signals are shown in Figure 2, and may be obtained using an optical isolator or a relay. The minimum requirements are to switch 3OV, 10 mA. At 10 mA**,** the output "LOW" must not exceed 0.8 volts. The logic is as follows:

- Board transfer occurs when Machine A has a board available (contact closed), and Machine B is not busy (contact closed).
- The signals can occur at anytime, but board transfer does not occur until both contacts are closed.
- The Board is Available signal from machine A will remain closed until the board has left Machine A.
- The Ready signal will remain closed until the board has arrived at Machine B.
- Board transfer cannot occur again until each signal opens for at least 50 ms.
- *Optional:* Once both Machine A and Machine B signals are closed, and the board has neither left A nor arrived at B, an error message will be generated.

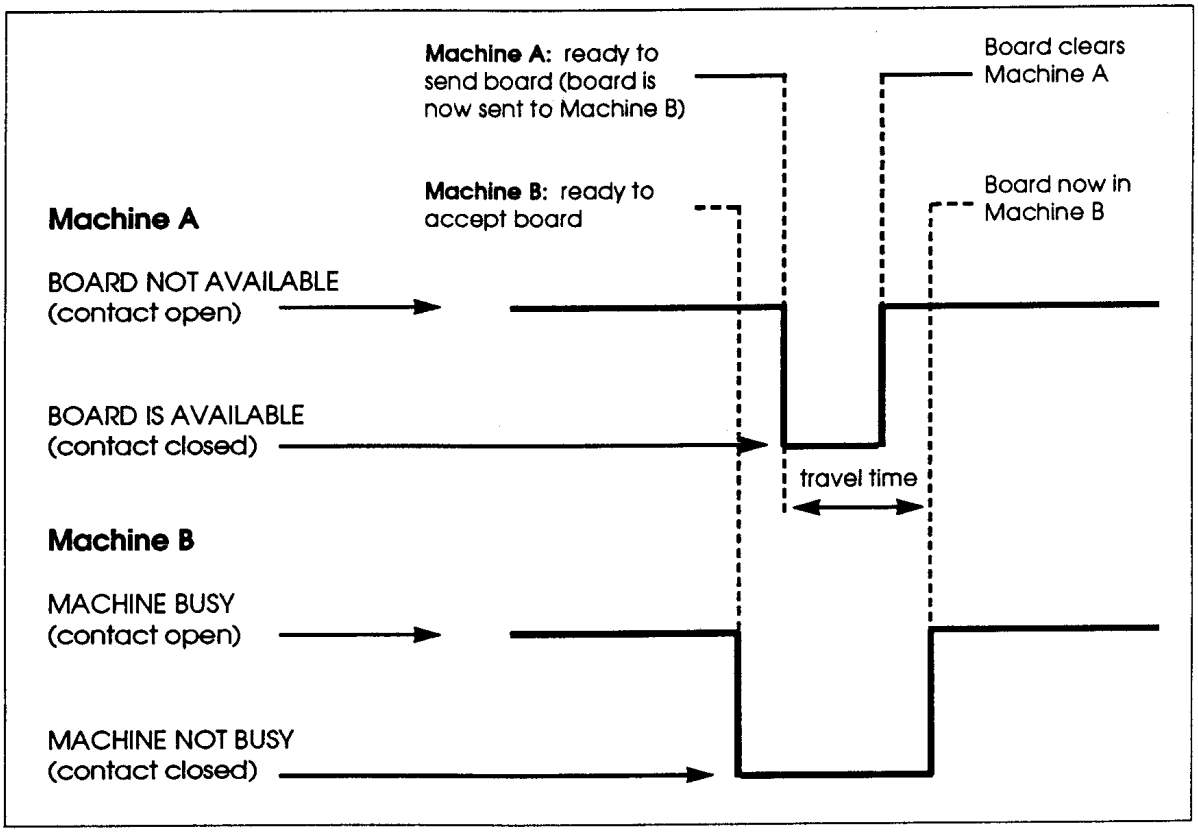
Machine A: ready to send board (board is now sent to Machine B)
Board clears Machine A
Machine B: ready to accept board
Board now in Machine B
Machine A
BOARD NOT AVAILABLE (contact open)
BOARD IS AVAILABLE (contact closed)
travel time
Machine B
MACHINE BUSY (contact open)
MACHINE NOT BUSY (contact closed)

Figure 2. Timing Diagram

SMEMA Connector Specifications

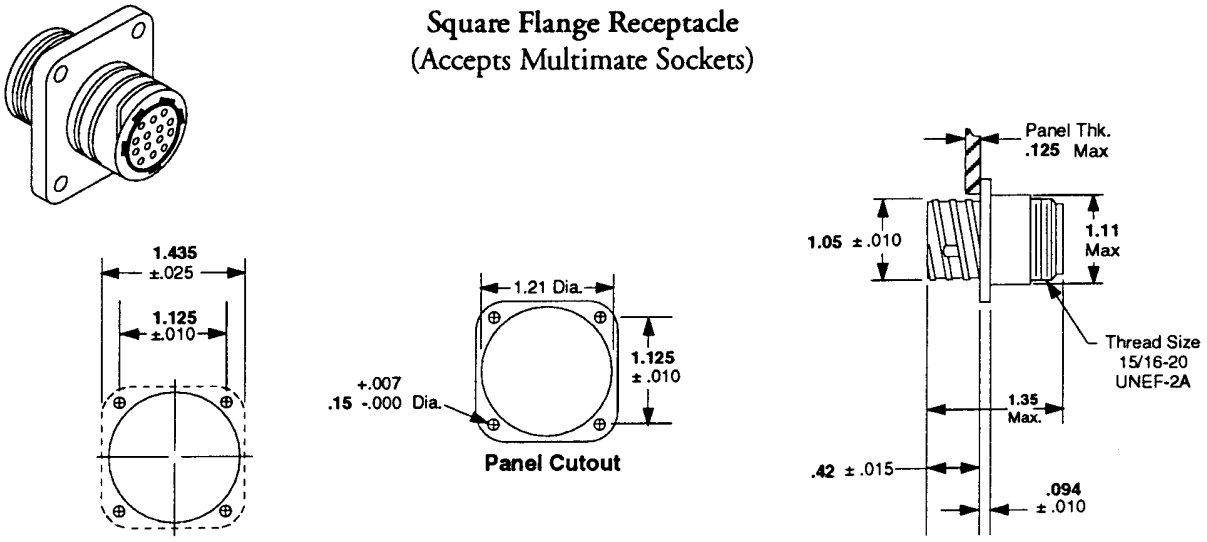

Figure 4 SMEMA #001: Machine Connector

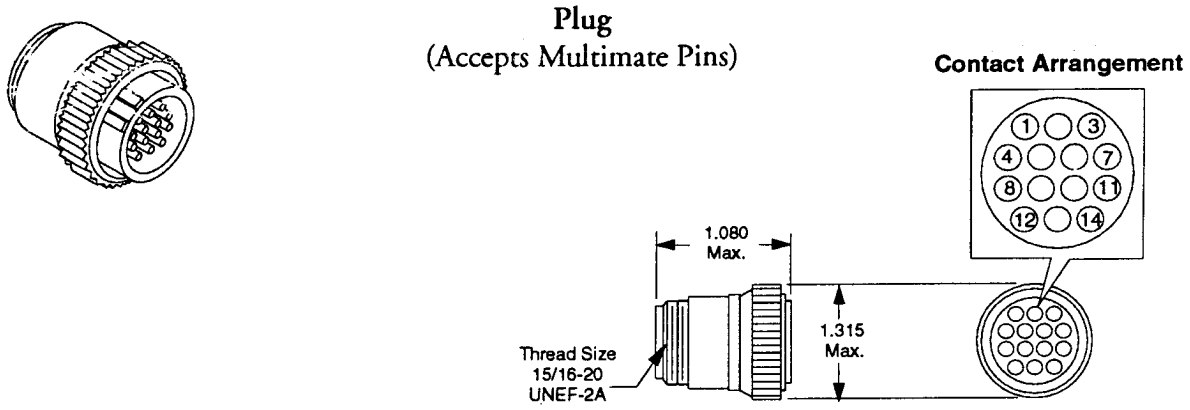

Figure 4. SMEMA #002: Cable Connector

About SMEMA

The Surface Mount Equipment Manufacturers Association (SMEMA) is a non-profit organization of companies manufacturing equipment or producing software for surface mount board production. Its objectives are to: promote standards for the interface and operation of equipment, provide users with the ability to select equipment with the assurance that the equipment will interface easily, advance SMT and promote its use and investigate areas where the association can act to the benefit of all member companies.